OUR BRITISH TREES

AND HOW TO KNOW THEM

Francis Geo. Heath

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AND HOW TO KNOW THEM

BY

FRANCIS GEORGE HEATH

SECOND (AND CHEAPER) EDITION

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PREFACE.

THIRTY years ago I wrote my first Tree book, "Our Woodland Trees," a modest endeavour, designed, not to call attention to a new subject, but to reanimate a very old subject: to inculcate a love for what have been aptly termed "the buildings of God." The pioneer in this endeavour was dear old Gilpin, who had been inspired, a hundred years previously, to write on the same delightful theme, the result being the production, amongst other charming works, of his famous "Forest Scenery." But when I took up my pen, in 1877, I found that "Forest Scenery" was lying dust-covered, neglected, and practically forgotten, on the upper and out-of-the-way shelves of second-hand booksellers.

My encouragement in trying the effect of enthusiasm—which is said to be infectious—in the treatment of a subject naturally calculated to excite admiration—had arisen from the signal success which had attended the striking of the

first note—so to speak—by the production, in 1875, of my book "The Fern Paradise"—a Plea for the Culture of Ferns—my maiden attempt at descriptive writing. So generously and eloquently kind was the Press reception of this most unpretending little volume, that I was constrained to follow, in 1877, with "The Fern World," which, coming out in August of that year, ran into several editions before the ensuing Christmas; and I was indeed pleased to find that even the cold of Winter did not extinguish—in the minds of my readers—the sparks of enthusiasm that I had sprinkled through my pages, for the sales of both books were rapidly extended to every English-speaking country in the world.

Then I turned to the subject of the beautiful "buildings of God" and produced "Our Woodland Trees," which I dedicated "to all lovers of Nature," in the hope that they might derive some pleasure from its perusal. In its preface I said: "This volume has not, even in the slightest degree, been suggested by the desire to make a pretentious book. It owes its existence to an enthusiastic love of the subject to which it relates. It has, therefore, been written lovingly, and it

will be put forward confidently; with a confidence, however, born of a belief, not in any especial claim of the work on the attention of the public, but in the existence amongst English people, of an intense—nay, of an enthusiastic—love of Nature. This feeling of love for Nature is, doubtless, sometimes latent, and often undeveloped. But the author repeats his belief that it is shared by the vast majority of English people. He himself was born in a part of England famed, the wide world over, for its enchanting scenery, yet he cannot remember that, during his residence there in his childhood, his feelings were stirred into enthusiastic love of the country, though there can be no doubt that this love was then born by the influence of his surroundings, and existed, though latent by the absence of an exciting cause. But the time came for the choice of a profession, and for a residence in the Metropolis. Then it was that the latent love of Nature was developed with full force, and became a passion. The absence of woods and fields gave rise to a painful longing to renew acquaintance with them on every possible occasion, and no recreation was so much prized as communication with Nature in her wildest haunts."

I added—this was thirty years ago—"the author is convinced that his experience is the experience of a large number of his countrymen." The answer to the suggestion that the book was wanted to enkindle a latent but existent love of Trees was found in the enormous demand for it; and, although it was published at what, to many people, was probably a prohibitive price—12 6—it went to every English-speaking country in the world, and has for many years been so hopelessly "out of print" that I have tried in vain to obtain a copy for myself, the only one I now possess being the publishers' "file copy."

To meet the enquiries for it that are continually reaching me I have decided, not to reissue "Our Woodland Trees," but to produce A NEW BOOK—the present one—that will not only cover all the old ground, but a good deal more that was excluded under the previous title, and be accessible at appreciably less than the price of the earlier book.

As my aim in this new book is to produce A POCKET VOLUME, it is obvious that a complete account of all the Trees grown in these Islands would be impossible. The only existing book of this kind is Loudon's magnificent work in eight

volumes, the *Arboretum et Fruticetum Britannicum*, published in 1838, and I have been assured by expert authorities, whose opinion I fully confirm, that this monumental book of the well-known horticulturist, is the greatest work of the kind ever conceived and has never been outrivalled. But that work, even in its second-hand condition, costs several pounds, and cannot possibly be used as a "Pocket Book."

I have not limited my subjects to native Trees, and I do not wish to enter the field of controversy as to what are and what are not native Trees. No man living can possibly fully determine the point. All "our Trees" are interesting, and many Trees that are known to have been introduced from other countries are such familiar objects, to the most casual observer, that it would be a great mistake to omit some, at least, of them.

My object is to tell those who have seen Trees and are interested in them, something about them, and, in short, "how to know" the beautiful objects of their curiosity; for it is the fact that a very large number of people who know a Tree by sight know nothing more, and are quite unable to name it.

All, except a few, of the illustrations are my own production, and are derived from photographs I have myself taken of the leaves, trunks or boles, or of the full form of the Trees. Some of my illustrations of leaves are absolutely and literally nature prints, obtained, by a process of my own, from the leaves, not by pressing them into a soft substance in the old-fashioned way, but by the aid of transmitted light through the substance of the leaf. Good examples of the results obtainable from this method, which is not photography, are shown in the illustrations of the leaves of the Grey Poplar (page 378), the Rose (page 403), and the Downy Viburnum (page 433). For the subjects of these illustrations, I am largely indebted to Kew Gardens.

A novel feature will be found in my pictures of "leaf sprays" showing the arrangement of leaves on their twigs. These were all obtained from leaves collected, arranged and photographed by myself. Examples of these "leaf sprays" will be found at pages 77, 93, 134, 158, 204, 253, 285, 362, 437, 443, 447, and 451, representing the Beech, Bird Cherry, Chestnut, Wych Elm, Hornbeam, Lime, Mulberry Tree, Oriental Plane,

Walnut, Wayfaring Tree, Whitebeam, and Wild Service Tree; and the amount of time and care involved in the process was very considerable. The object has been to give a *facsimile* of Nature; and the letterpress descriptions of leaves in this volume, with details of their beautiful venation, or system of veins, are introduced with the same object.

I have made a special study of leaves, in their spring, summer and autumn appearance, and I think that an object of especial educational importance will be achieved by publishing the results of this study—for nothing is more likely to inculcate a love of Nature than to attract attention to the exquisite perfection of her wonderful workings in this fascinating department.

Another especial feature introduced into the volume is the diagramatic illustrations of Tree structure. For the originals of the engravings of Figures 4 to 11 (pages 21 to 25) I am indebted to Mr. Abraham Flatters, of Manchester, and for Figures 3 and 12 to 22 (pages 12 and 26 to 36) my obligations are due to Mr. James A. Weale, of Liverpool. Both these gentlemen are experts in the production of diametric photographs of

wood sections, and their photographs, from which the engravings have been made, are really admirable productions.

I wish to say here that I have not attempted to give in my engravings—all made from my own photographs—of the full figures of our deciduous trees, the summer appearance, because to do so would have been of little use. The characteristic form of any tree is only accurately shown in Winter. This characteristic form is almost entirely disguised when the leafage comes on. Gilpin rightly remarks that to have a more accurate idea of "the nice peculiarities" as he phrases it of trees, we should examine their smaller parts with a little more precision, their ramification in winter, as well as the mass of foliage which they exhibit in summer. He adds: "Winter discovers the nicer parts of the ramification the little tender spray on which the hanging of the foliage and the peculiar character of the Tree so much depend."

Gilpin was of course discussing "Forest Scenery," and in any book, such as his the old aquatint illustrations in which I had redrawn and engraved on wood for my edition of it, published in

Fig. 250—The Acacia in Summer
(*Robinia pseud-acacia*).

1879—representations of trees in summer are most essential, for foliage plays an important part in the effects of light, because wonderful and beautiful results are produced by shadows and the various shades of green contrasting with each other; but for the identification of trees all that is needed is to give accurate representations of the boles and spray—for winter study and of the leaves for summer identification.

The illustration, on the preceding page, of The Acacia, Fig. 250, in its Summer appearance, will indicate my meaning, and if that be compared with the Winter form on page 44, it will, I think, be admitted that the Summer print is of little use.

In conclusion, may I modestly claim to have done something to create and foster during the period from 1877, to the present time the existing love of Trees. If this claim be admitted my reward will be found in a public appreciation of "Our British Trees and how to know them."

FRANCIS GEORGE HEATH.

SILVERTON,

DEVON.

December, 1907.

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OUR TREES,

AND HOW TO KNOW THEM.

PREAMBLE.

TREES are, of course, the giants of the vegetable world: but what is it that may be said to distinguish them from other plants?

Meaning of word "Tree."

In several languages the word itself, or a similar one, or the word into which our "Tree" would be translated, means, simply, wood, or a piece of wood. The popular idea, and a correct one, is that a plant which has wood, from which articles can be made, is a Tree: that is to say, a plant large enough to possess a trunk or bole—that stands up conspicuously as the base or support of the branches above—is a Tree; and this idea suggests the best explanation of the difference between a Tree and a smaller plant.

What is a shrub!

A Tree in miniature is popularly called a shrub:—a shrub being merely a small Tree, with a little stem, single or multiple, and other stems branching from it, and having a woody

substance covered by a thick cuticle, called bark: but the tissue of which this covering, and the substance it encloses, consists will be presently defined; and it will be seen how it is that in some cases it remains soft, or what is termed "herbaceous" generally keeping small in size and liable, from its tender character, to be fatally injured by extreme cold whilst, in other cases, it enlarges, thickens and hardens into the substance called wood.

Evolution of plants.

What, however, is not generally known is that a very large number of small and delicate plants which in temperate climes remain "herbaceous" and small, become shrubs or Trees in the tropics: so that it is clearly, to a large extent, dependent upon conditions of growth whether a plant will remain small and insignificant or develop into the noble proportions of what we call a Tree. Even in this country we can find evidence of the immense difference in growth, under varying conditions, in plants of the same kind.

Influence of aspect and soil.

A plant, like an animal, has likes and dislikes, and as it cannot choose its habitat—seeds and seedlings being often placed in the ground in uncongenial positions—the resulting growth is determined by the varying character of aspect and soil. Familiar evidence of what has just been stated is afforded by the well-known holly, which, in hedges and plantations and in small gardens, is ordinarily seen as a small or large shrub; but,

growing in the positions which this plant likes best as in the depths of a forest, sheltered by

Fig. 1—ACER PALMATUM, 49 years old, 24 inches high.

large trees and encouraged by a perpetually moist atmosphere and deep rich soil of leaf-mould it

becomes a Tree. In the New Forest, in Hampshire, the present writer has seen and measured

Fig. 2.—Juniperus procumberus—80 years old.

hollies nine feet in girth, or one yard in diameter. If absolute and tangible evidence be required

of how conditions of growth affect plants, it is furnished by the extraordinary but interesting Japanese dwarf Trees, of which, as many of our readers have probably never seen them, we introduce two engravings from photographs. One of these, a Maple—*Acer palmatum*—is 49 years old, is only 24 inches high, and is growing in a pot! The other, a Juniper—*Juniperus procumberus*—is 80 years old, and is also growing in a pot! Here is a list of some of these—photographs of which have been courteously furnished to us by the importers, Messrs. Bunneys, of Liverpool, to whom we are indebted for the subjects of our engravings:—*Thuja abtusa*, 28 inches high, 100 years old; *Carpinus japonica*, 32 inches high, 50 years old; an Oak—*Quercus dentata*, 65 years old; another Maple—*Acer sanguineum*, 32 inches high, and 75 years old; and yet another, *Acer trifidium*, 38 inches high, and 85 years old. There is a *Tsuga sieboldii*, 120 years old, and a specimen of *Euscophis Staphyleoides*, 200 years old! This last mentioned monstrosity, is 3 feet round the trunk, and in a pot!

How is this dwarf condition maintained in this marvellous manner? Simply by repressing nature, that is to say, by regularly, year after year, "pinching back" the young growth, and jealously shifting into the smallest possible larger pot "every few years;" and when they are shifted giving the smallest possible amount of nutriment for the roots. The cultural instructions say:—"These forest Trees are capable of growing to a great size"—as we all know—and they can

only be kept in their "Tom Thumb" condition by discouraging growth.

Mystery of growth.

The mystery of growth, the automatic power by which the germ or seed, sometimes an insignificant atom of matter, develops into the gigantic structure of the Tree an operation that frequently requires centuries for completion—is beyond our finite understanding. Volumes of discussion would bring us no nearer to a solution of the beauty of this mystery. As the author once remarked: "When science has told us all it can tell of the workings of nature in the vegetable world -as elsewhere—we still stand, so to speak, on the brink of an abyss, gazing out into absolute and almost impenetrable darkness." But what science has discovered is absorbingly interesting, and it will be important to briefly narrate the history of a Tree from its origination to its completion.

Division of flowering plants.

All flowering plants in the vegetable kingdom are divided into two great groups -one called *Monocotyledons*, the other called *Dicotyledons*. *Cotyledon* means a seed lobe or rudimentary leaf, and *Monocotyledons* are plants having only one seed lobe, or, if more than one, having them placed in alternation on the stem. *Dicotyledon* means two or more—generally two -cotyledons placed side by side. The cotyledons are roundish bodies, sometimes thick and fleshy, as in the acorn and in the chestnut; sometimes thin, as in the

maple seed, and sometimes crumpled or folded, as in other seeds. They furnish a sort of fulcrum, or basis, for the coming plant, and serve also as a store-house of food for the plantlet in its first stage.

Forms of root and stem.

A variously-shaped, but usually cylindrical, body is placed between the little cotyledons and is joined to them—one end, the upper one, of this small body, being what is termed the *plumule* or germ of the future stem, the under end being called the *radicle* or germ of the future root. The double germ, consisting of plumule and radicle joined end to end, is called the *axis*, as it is the base, or foundation, of the entire plant. The integuments or coverings of the vital parts of the plantlet are pierced by a minute aperture called the *micropyle*, which expression comes from two Greek words, and means a small gate or orifice.

Mystery of fertilisation.

Here again we are confronted by the profound mystery as well as by the beauty of nature. The *micropyle* is the opening through which the fertilising *pollen* of the plant penetrates to its nucleus and communicates the marvellous life—the power, the wonderful power, that alone enables it to grow and develop, stage by stage, into the complete fabric of the Tree. The conical-shaped radicle of the axis is ordinarily so placed as to point to the micropyle.

Nature's methods.

But—as the writer has said in a previous work—"Nature is not content to make her enveloped seeds perfect in every part. She endows them with some quality which shall enable them, when freed from the parent plant, to find their proper sphere of growth. Sometimes she temptingly baits them with luscious edible coverings, which may tempt birds or animals to disperse them; and sometimes she provides them with wings that may themselves take flight, and find fit resting places, as in the downy hairs of the seeds of willows and in the membraneous wings of pine seeds." More than a century before the commencement of the Christian era, Theocritus wrote: "Sweet is the murmur of the wind among the Pine Trees"; and how beautiful is the reflection that often, in the mellow seeding time, the aërial currents bear away lovingly on the sweet crest of a musical swell, the winged germs of a future generation of Trees!

Differing vitality of seeds.

And here a point of great interest arises in the varying degrees of vitality of different Tree seeds, a vitality which is brief in some cases, whilst, in others, it is extended over long periods of time, when it has happened that during these periods something has occurred to withdraw the seeds from the conditions that must be present to enable growth and development to take place. Air, moisture and warmth, for instance, are essential to this growth, and when seeds

have been accidentally buried in geological strata their germination has been suspended for centuries ; coming into operation only when some upheaval has caused the germs to be brought within the influence of the growing conditions.

"Nurses" for incipient Trees.

It has been indicated that the cotyledons provide food for the growing plantlet. They perform, in fact, the useful office of nurses, until the plumule and radicle, at a little later stage, are enabled to obtain, from the air and the soil respectively, those elemental substances that build up the structure of the plant. The self-feeding ensues when the initial radicle develops into the root, from which grow root-fibres and root-hairs formed to draw chemical nourishment from the soil ; and when the plumule grows into the stem from which proceed leaves that extract nutriment from the air, both obtaining their supplies in a way that will presently be described.

Plants drink and breathe.

Plants, like human beings, and other animals, are composed of elements which are obtained from the material world. The method of supply, however, varies in the case of plants, although in many respects it is similar. Like animals, plants may be said to drink and to breathe. They consume substances around them, digest them and assimilate them in a manner suited to their particular organisations. Unlike animals they do not produce heat, and their temperature is ordinarily that of the air or water

(in the case of aquatic plants) that surrounds them. Their sustenance is obtained in two ways —from the air, through their leaves ; and from the soil through their root-hairs, rootlets and roots.

Beautiful cellular system.

It should be premised that the whole plant is constructed of little cells, surrounded by walls that are botanically termed cell-walls. The cavities, or cells, and the cell-walls may be roughly likened to honey-comb—the wax frame-work of the comb being somewhat similar to the cell-walls, and the contained honey may be said to represent the contents of the cells. The shape, of course, is different, as are the structure and contents. In plants, the latter is called sap, which is a viscous or semi-fluid matter including what is known as *protoplasm*. The substance of which the cell-walls is composed is *cellulose*, intermixed with a watery fluid. The whole—cell-wall and contents—is generally, so to speak, known as *cellulose*, by which, in this case, is meant a definition of the whole—cellulose, in the sense intended, meaning cellular substance.

Tissues of plants.

Perhaps the word *tissue* is a better general expression, because there are three kinds of tissue—cellular tissue consisting of the softer parts—the cells being roundish—wood tissue, having the cells elongated, compressed and hardened to form wood. There is yet another kind of tissue called *vascular tissue*, consisting also of elongated

cells or tubes ; but these tubes are thinner than those in wood tissue, and they enclose long vessels called spiral threads. The substance of which cellulose is compounded consists of carbon, hydrogen and oxygen ; and protoplasm consists of carbon, hydrogen, nitrogen and oxygen.

What gives colour.

The beautiful green colour of leaves and stems is caused by the presence, within the tissue, of granules of a colouring matter called *chlorophyll ;* but as the colouring of plants is not only green, but of varying hues, it will be convenient to term the colouring substance *chromophyll*—the colouring being produced by the action of sunlight in a way that is largely mysterious. There is observable a tinge of blue in the leaves of many Trees, gold in the foliage of limes, and gold also in oak and birch and many other leaves. Purple and crimson, too, are often seen.

What makes leaves glossy.

Whilst mention is made of the beauty of colour, it will be interesting to note that the glossiness of many leaves is occasioned by the extreme transparency and reflecting power of the surface walls of the superficial cells.

The roots take in, by absorption from the soil—as contributions to its general structure —such chemical substances contained in the water that percolates through the soil—as calcium, iron, nitrogen, phosphorous, potash, soda and sulphur — these constituents being obtained from the soil according to its character.

Breathing mouths.

A beautiful office is performed by the leaves, which, chiefly on their under-sides, are studded with thousands of tiny openings called *stomata*. A *stoma*—the derivation being from a Greek word—

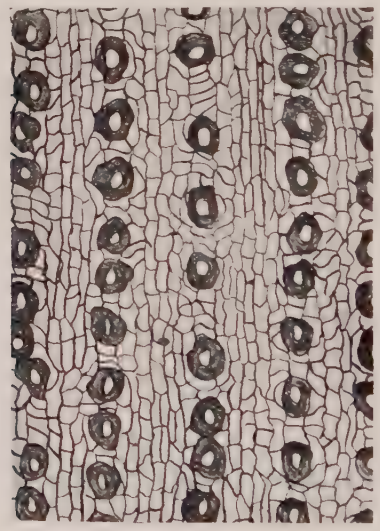


Fig. 3.

Stomata in surface of Leaf of Monkey Puzzle (*Pinus araucaria*)—magnified 30 diameters.

means a mouth, and is a minute orifice or slit in the epidermis of the leaf through which air is admitted. The *stomata* are open during daylight

and closed at night. When an animal respires, it emits carbonic-acid gas, a deleterious compound of carbon and oxygen.

Plants purify the air.

Through their *stomata*, leaves take in this gas, retain the carbon of the compound to help in the building up of the woody structure of the plant, and return the oxygen -a health-giving gas—to the air, which is thus purified and made more wholesome for the benefit of the animals which breathe it. In one leaf of an apple Tree it is said that more than a hundred thousand *stomata* have been counted!

Having shown the sources of supply—of the plant's food, drink and air—for promoting the growth and development of the small plumule and radicle which are the points of departure, and having indicated the form of the tissue of which it is constructed, let us now turn to the process by which it is believed this increase of size is effected. We have seen that even in the form which is the beginning of the fabric that is to enlarge into the magnificent proportions of the perfect Tree, the utmost simplicity of arrangement prevails.

Wonderful power of light.

There is an aggregation of little cells enclosing viscous matter, all derived from the air and the soil and stimulated by the mysterious and wonderful power of light—the agents for collection being the root-filaments, or root-hairs, and the *stomata*.

There are two methods of increase, because flowering plants, including Trees, are divided, throughout the Vegetable Kingdom, into two classes. One is called *exogens*, the other *endogens*. The first named comprises plants whose growth is effected by additions to the stem or trunk outwards, whilst *endogens* increase by internal additions. But as all the Trees which form the subject of this volume are included in the class of *exogens*, we will confine our description to these.

How growth is effected.

In the centre of the protoplasmic fluid contained in each cell, there is a rounded substance, darker than the rest. This is designated the *nucleus;* and it is believed that growth is effected by the nucleus separating into halves, and around each half little cell-walls are formed, so that it is by a multiplication of cells that the tissue is enlarged to produce the increase of bulk. The rate of increase varies considerably in different Trees, some growing at a much greater rate than others. When the cells have ceased to divide, they begin -each within itself— the process of development caused by a continued secretion, by the protoplasm, of cellulose. By the same means the cell-walls are thickened, and of course begin to occupy more space.

The plant manufactory.

Each cell is therefore a manufactory, and produces, as we know, a multiplicity of substances

which minister to the wants of mankind. Juices to drink and flavour food, gums, drugs, liquid for dyes, chromophyll for colouring, oil, resin, starch, sugar, wax, and so many other things that a big volume would be required to define and describe them.

The order and arrangement of the tissue of a Tree may be illustrated by a very familiar one—the Lime. There is a central column of tissue, popularly called the *pith*. Over this is a layer of wood tissue mixed with a portion of vascular tissue. Then comes a layer of what is called *bast* tissue or incipient inner bark. Then again a layer of *cellular tissue* or incipient outer bark. Running, however, through the inner cylinders of tissue from the inner column, or pith, to the outer cylinder, or bark, are thin "rays" of cellular tissue. These last named may be roughly compared to the spokes of a wheel.

How Wood increases.

After the first year, the cell-multiplication process causes an addition of wood tissue *outside* the first cylinder of wood tissue and between it and the first-formed bast tissue. The bast tissue is renewed by a new formation of the same kind of tissue *inside* the old bast tissue this last-named process of tissue formation being in the reverse order of that which contributes to the formation of wood; and it will be noted, by this simple and beautiful arrangement, that, whilst the method of *exogenous* growth of the wood tissue is adapted to the permanent con-

solidation of the woody or solid substance of a Tree, the formation of the newest coats of incipient bark—or *liber* as it is called—inside the earlier-formed or older bark, admits of the peeling off of the latter to make room for the increased circumference of the stem.

Progress of plant functions.

Each year the allotted task is performed—actively during the spring and summer, more slowly during the autumn, and restingly during the winter: for although during the winter periods of cold, plant functions are supposed to cease, it cannot be affirmed, with absolute certainty, that something is not being done to elaborate and perfect the work of the growing seasons by at least the roots of Trees, although we know in the case of deciduous ones, or those whose leaves fall off and decay, that departed leaves cannot draw sustenance from the atmosphere; but it cannot be affirmed that some nourishment may not be conveyed through the bark, especially during its incipient period, and it is quite likely that winter rootlets may be completing and perfecting something in their marvellous laboratories.

How to know age.

Nature, indeed, is seldom still, and it is deeply interesting for the lover of nature to watch, from time to time, the progress of a plant in the beautiful process of its development. In the

earlier stages of its growth it is not difficult to fix its age with some degree of certainty ; but as time goes on, with increasing bulk there is hardening of the bark and an appearance of fixed stability that makes it impossible absolutely to determine age, especially as mere size is not a criterion.

What affects growth.

The amount of growth varies in different years according to climatic and other circumstances—warm moist springs and summers followed by mild winters being conducive to progress, whilst cold and dry seasons retard it. But age can be determined with absolute certainty when the bole of a Tree, that is to say of an exogenous Tree, is cut across, because there is a noticeable ring—what is termed a concentric ring—of wood which marks each year of growth. Some of these rings are wider than others, and these may not only mark a moist and warm year, but they may indicate the arrival, by the extending and spreading roots, at beds of leaf-mould or other soil, especially conducive to the formation of woody substance.

Age "rings" of Scotch Pine.

An illustration of this interesting variation may be quoted. A Scotch Pine (*Pinus sylvestris*) was cut down at the age of 272 years, this term of life being exactly determined by the presence of 272 concentric rings of wood. The Tree was

cut across at five feet from the ground. The aggregated widths of the woody rings for successive periods of ten years was as follows: The first ten rings, beginning of course from the centre, measured across 0·36 of an inch. The width for the next period of ten years measured 0·51 of an inch. The third ten years showed 0·28 of an inch only; but eclipsing all the growth of the decades up to thirty years, and the greatest proportionate growth for any ten-years period of the 272 years, was that for the period which completed its fiftieth year, when a width of wood measuring 2·11 inches was made.

Progress of diametric growth.

In the succeeding ten years, the diametric growth was 2·06 inches. During the following fifty years, bringing the age up to 110 years, the growths respectively measured 1·74, 1·70, 1·21, 1·53 and 1·25 inches. During the succeeding five decades the diameter of the annual growths was respectively 0·56, 0·96, 1·22, 0·92 and 1·03 in inches and fractions of an inch. The growth, so far indicated, represents 150 years. For the succeeding fifty years, bringing the age up to 200 years, each ten years' growth was at the subjoined rate: —1·01, 0·93, 0·62, 0·90 and 1·37. For the succeeding twenty years the radial width was 1·62 inches, and during the next five decades the figures are, 1.11, 0·98, 1·59, 1·08 and 0·92. When it was cut down, two years later, it was found, naturally, that the radial growth for this last

period of two years was only 0·14 of an inch.

History of an Oak.

In a little volume called "Tree Gossip," published by the present writer in 1885, and designed to deal not with the most easily-accessible facts about Trees, but with what might be called the byeways of Tree life—a volume that was much appreciated and has been long out of print—there was included a very interesting history of an oak communicated to the author by Mr. Paterson, of Hunstrete, near Bristol. It was summarised as follows:—In May, 1883, an oak was cut across at fourteen feet from the ground, and at that part 192 concentric rings were counted. On the probable supposition that this Tree had taken the first twenty years of its growth to reach the height at which it was cut across, its age was calculated to be 212 years, and the date of planting must therefore have been 1670. Dividing the rings into sections corresponding to the several periods of its growth, the breadth of the rings in the sections was as follows: in the section corresponding to the years 1691 to 1710 inclusive, twenty years, $2\frac{14}{16}$ inches; 1711 to 1730, twenty years, $3\frac{3}{16}$ inches; 1731 to 1734, four years, $\frac{4}{16}$ of an inch; 1735 to 1742, eight years, $\frac{7}{16}$ of an inch; 1743 to 1750, eight years, $\frac{14}{16}$ of an inch; 1751 to 1770, twenty years, $2\frac{14}{16}$ inches; 1771 to 1790, twenty years, $2\frac{4}{16}$ inches; 1791 to 1810 twenty years, $2\frac{9}{16}$ inches; 1811 to 1830, twenty years, $2\frac{6}{16}$ inches; 1831 to 1850, twenty years,

$1\frac{11}{16}$ inches; 1851 to 1870, twenty years, $1\frac{5}{16}$ inches; 1871 to 1882, twelve years, $\frac{7}{16}$ of an inch.

Weather indicated by Oak "rings."

Mr. Paterson drew the inference that the period of slowest growth (1735-1742), must have been a period of exceptional weather, and in a further communication to the Author he gave evidence of the correctness of his surmise by showing that a season of great cold was included within it. In 1740, according to a published statement, the snow lay eight feet deep in Spain and Portugal. The Zuyder Zee was frozen over, and many thousands of persons walked and skated on it. At Leyden the thermometer fell to 10° below zero of Fahrenheit's scale. All the lakes in England froze; and a whole ox was roasted on the Thames. Many Trees were killed by the frost, and postillions were benumbed in their saddles.

Story of a Larch.

"Yet sometimes," it was added by the author in 'Tree Gossip,' "the difference in the width of the rings in a Tree is difficult to account for, as is instanced in the case of a Larch which was cut down in Scotland. The rings of this Tree were, on one side, double the width of those on the other; and the widest rings were on the north side of the Tree, that is, on the least warm, the least sunny, and the least genial side."

There are some unfathomable mysteries in nature, but they sometimes give way to patient and skilful investigation. It occurs now to the writer to suggest that possibly the foraging rootlets on the north side of this Larch might have penetrated an exceptionally rich bed of leaf mould, or reached greater moisture from some spring percolating through the soil, and such favourable conditions on one side of a Tree might possibly account for the extra width of the rings of wood on the north side.

Before proceeding to the proposed alphabetical enumeration of "Our Trees," we propose to give some interesting diagrams illustrating the internal structure of Trees :—

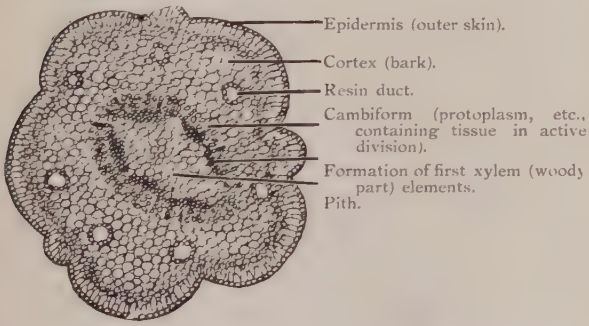


FIG. 4. -Transverse section of Scotch Pine (*Pinus sylvestris*), magnified 8 diameters showing commencement of formation of secondary wood.

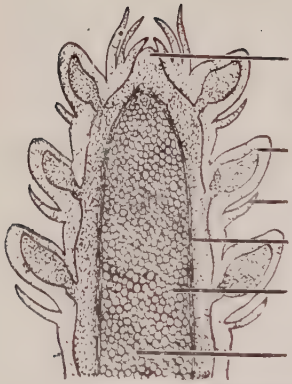


FIG. 5. Longitudinal section of growing tip of main stem of young Scotch Pine, magnified 5 diameters, exhibiting Karyokinesis (active changes in operation) in various stages.

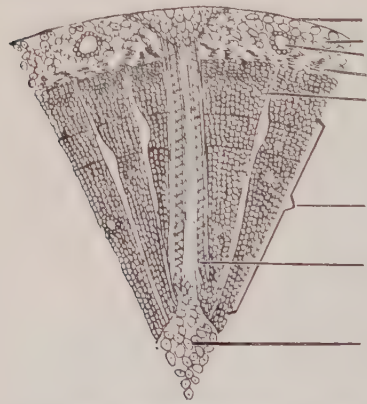

Epidermis (outer skin).
Loose primary ground tissue.
Resin duct.
Cambium (secretion for nourishment.)
Primary medullary ray (the medullary rays are radiating plates of cellular tissue, proceeding from the medullar, or pith, to the bark).
Xylem (woody part 'plates.
Vascular bundle to serve young branch– vascular tissue consists of vessels or ducts.
Pith.

FIG. 6. Transverse section of stem of Scotch Pine, after formation of secondary wood, magnified 15 diameters.

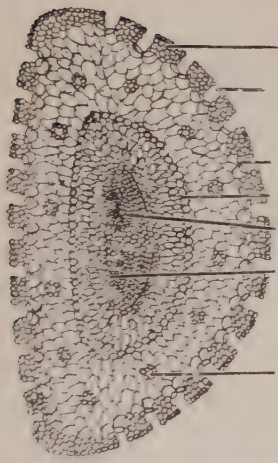

Prosenchyma (the fibro-vascular tissue or framework).
Stoma (breathing pore).
Guard cells (which enclose the opening of the stoma).
Vascular (vessels or ducts) system of of leaf
Phloem (bast part) of bundle.
Xylem (woody part) of bundle.
Resin duct.

FIG. 7. - Transverse section of leaf of Scotch Pine (centric leaf)—magnified 15 diameters.

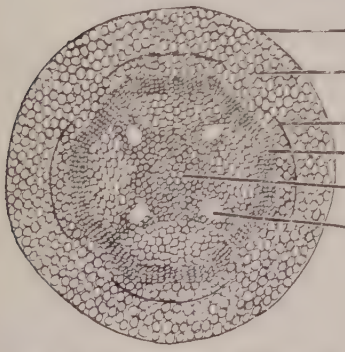

Epiblema (imperfectly formed epidermis).
Cortical tissue (outer cell substances).
Prosenchyma (fibro-vascular band.)
Pericycle (course of new cell walls).
Central axis of root.
Resin duct.

FIG. 8.—Transverse section of root of Scotch Pine - magnified 25 diameters.

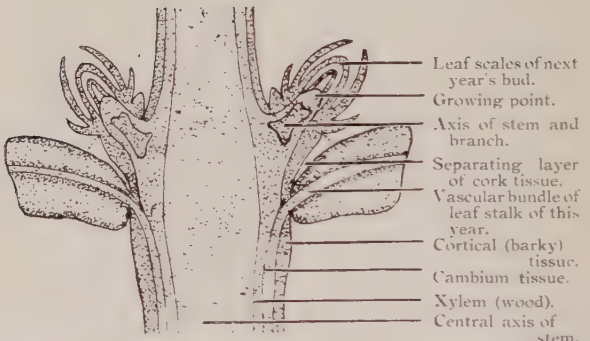

Leaf scales of next year's bud.
Growing point.
Axis of stem and branch.
Separating layer of cork tissue.
Vascular bundle of leaf stalk of this year.
Cortical (barky) tissue.
Cambium tissue.
Xylem (wood).
Central axis of stem.

FIG. 9. Longitudinal (medium) section of stem of Sycamore (*Acer pseudo-platanus*) just before defoliation—magnified 10 diameters.

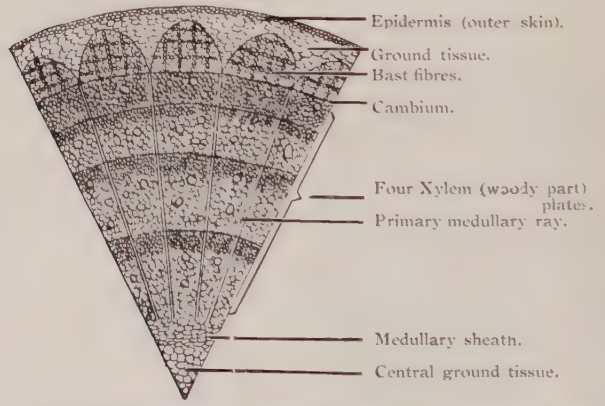


FIG. 10.—Transverse section of stem of Common Lime Tree (*Tilia vulgaris*)—magnified 15 diameters.

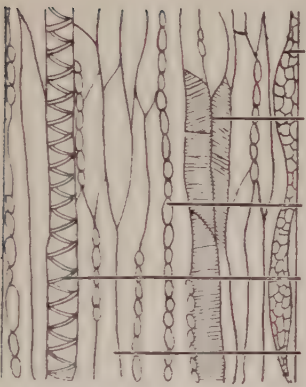


FIG. 11. Longitudinal section of stem of Common Lime Tree—magnified 45 diameters.

As considerable attention has been paid of late years to the study of the structure of wood, we think it will be interesting and important to include, in the immediately succeeding pages, a few illustrations as examples of varying growth. The Trees of the temperate zone are mostly deciduous and shed their leaves in the winter. If we examine a piece of the wood of one of these deciduous Trees across the grain, we shall find annual rings, or successive layers of annual growths. The cells between these annual rings are arranged in different ways, frequently in a very beautiful manner, and each species has its own distinctive characters. By observing this arrangement of the cells, it is possible to determine exactly what species a piece of wood belongs to.

Fig. 12 Yew Tree.

Transverse section--magnified 30 diameters.

Trees may be divided into two great classes—(1) Needle-leaved Trees, such as the Pine, the Fir, and the Larch, which bear their seeds

Fig. 13—Weymouth Pine.
Transverse section—magnified 30 diameters.

enclosed in a hard receptacle called a cone, for which reason the Trees bearing this kind of fructification are called "conifers," and (2) Broad-

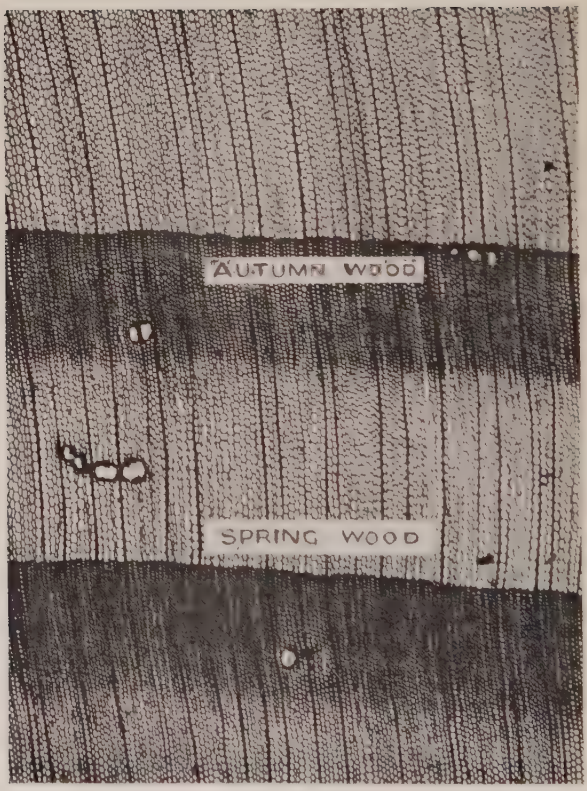


Fig. 14 LARCH.
Transverse section magnified 30 diameters.

leaved Trees, such as the Oak, Ash, and Maple, which bear their seeds enclosed in what is called a carpel, of which the Acorn and Cherry are examples.

Fig. 15—Oak.

Transverse section—Magnified 30 diameters.

The difference in the structure of the woods of these two great classes is so evident that a very little practice is sufficient to determine it. In

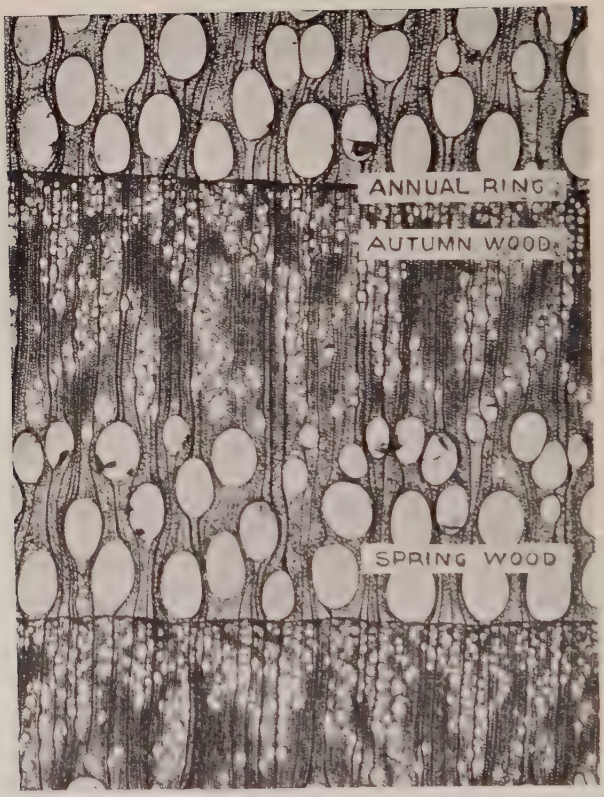


Fig. 16—CHESTNUT.

Transverse section—magnified 30 diameters.

identifying a wood we proceed by a process of "exhaustion," that is to say, we find what the wood is not, before we determine what the wood

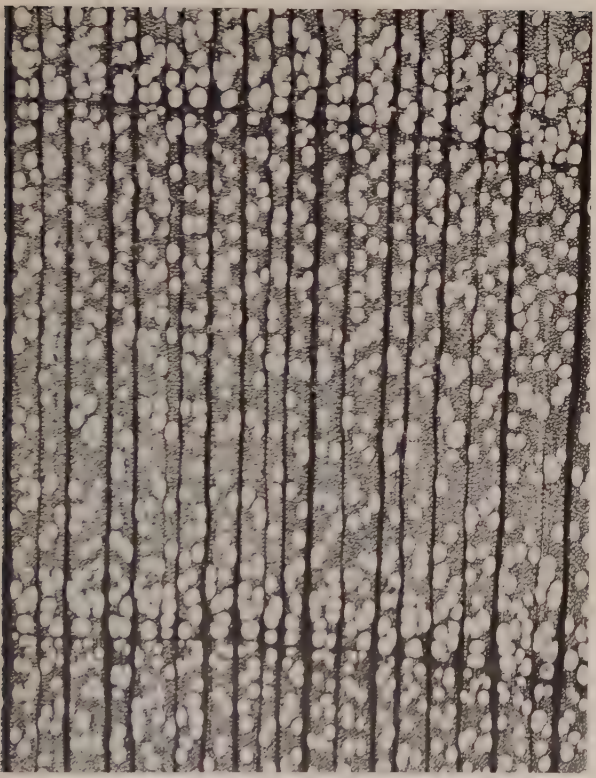


Fig. 17 CHERRY.

Transverse section—magnified 30 diameters.

is. When a piece of unknown wood is referred to us, we first look to see whether it is coniferous.

This is practically determined by the absence of

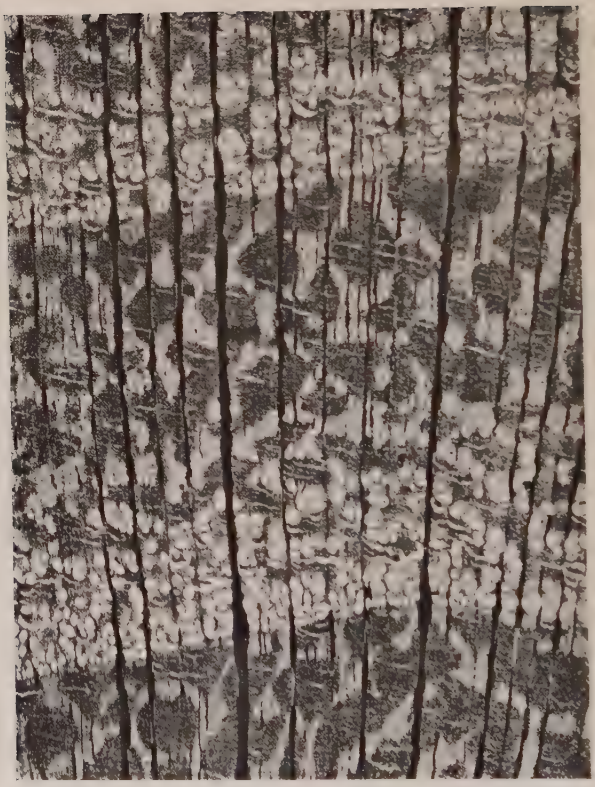


Fig. 18—Gorse.

Transverse section—magnified 30 diameters.

true vessels or pores, the wood being composed of regular, straight, radial rows of quadrangular meshes or tracheids. If it be decided that the

Fig. 19—HAZEL.
Transverse section—magnified 30 diameters.

wood is a conifer we next look for resin passages, for their presence or absence will tell us the class of conifer to which the specimen belongs. The

Fig. 20—Buckthorn.

Transverse section—magnified 30 diameters.

Yew, Cypress, and Juniper have no resin passages, whilst the Pine, Spruce, Fir, and Larch have them in more or less abundance. Should the

Fig. 21– Holly.

Transverse section—magnified 30 diameters.

wood not be coniferous, we next see if the annual ring is marked by a distinct line of large pores, as in the Chestnut (Fig. 16, page 30) which

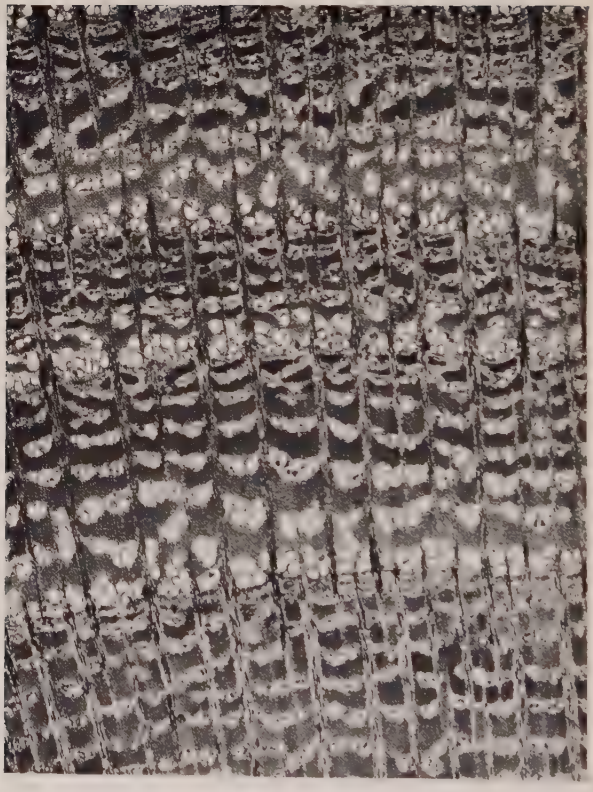


Fig. 22.—Laburnum.
Transverse section—magnified 30 diameters.

we call a "ring porous wood." If it is not "ring-porous," it will be "diffuse porous," or will have the pores evenly distributed throughout the annual

ring as in the illustration of the Holly (Fig. 21, page 35). So we proceed, dividing the woods according to their structure. The illustrations we give show the principal types of the woods of the temperate zone.

All the illustrations are from sections taken across the grain or transverse, and are at a uniform magnification of 30 diameters. Figs. 12, 13 and 14 (pages 26 to 28) are coniferous woods. Fig. 12 (page 26), the Yew, shows four annual rings and no resin passages. It is to be noted that the difference in the width of the annual ring shows the difference in the productiveness of different years. Fig. 13 (page 27), is the Weymouth Pine, or what is known to the timber trade as Yellow Pine. The small holes are the resin passages, and our section shows one annual ring. It must be observed, also, that the cells are almost uniform in size right through the ring, in distinction to Fig. 14 (page 28) showing a section of Larch, where the autumn wood is very sharply defined by a closer grain. Fig. 15 (page 29), exhibits the Oak. The medullary rays are broad, and the spring wood defined by a conspicuous band of large pores. The rays make the Oak very easy to distinguish from the Chestnut (Fig. 16, page 30), the rays of the latter being very narrow indeed, although the wood is prominently ring-porous. In the Cherry (Fig. 17, page 31) the rays are almost uniform in width, the pores are numerous, often subdivided, and almost evenly distributed throughout the ring. In the Gorse (Fig. 18, page 32), the spring wood is well marked; the rays slightly thicken at the annual

ring, and the pores have a random oblique arrangement in characteristic groups. If the Hazel (Fig. 19, page 33), is compared with the picture of the Oak (Fig. 15, page 29), it will be seen that although the rays are equally broad, there is a difference in their structure, for the rays of the Oak are like so many plates cemented together, while the rays of the Hazel show so many smaller pores, from which they are called "compound rays." The Buckthorn (Fig. 20, page 34), has a most beautiful structure, the pores being arranged in radial flame-like groups, very characteristic of the Rhamnaceæ, to which the Buckthorn belongs. In the Holly (Fig. 21, page 35), the rays are of a moderate width, with the pores evenly distributed. It is important to note that the Holly is not strictly an evergreen Tree, as the annual ring is plainly, though obscurely, evident. The Laburnum (Fig. 22, page 36), with its concentric festoons of pores, is most beautiful, and has a structure difficult to mistake. In each of these cases it is desirable that the student should compare a piece of the wood with the illustrations, bringing to his aid a small pocket lens. It is surprising how fascinating the study of the structure of wood becomes to an interested observer.

Our Trees Alphabetically described.

1

ACACIA.

(*Robinia pseud-acacia*).

GRACEFULNESS of foliage and extreme picturesqueness of trunk, or bole, are distinguishing characteristics of the Acacia. The common name, in several languages, means a thorn, sharp-pointed, needle-like; because of the thorniness or prickliness of the branches. The generic name is given in honour of Jean Robin, a French botanist whose son, Vespasian Robin, introduced the Tree into Europe, and the specific name of *Pseud-acacia*, or "false Acacia," and the further common name of Locust Tree, are derived from a former belief—interesting though unfounded—that it was this Tree that furnished food to St. John in the wilderness. We are told, in Holy Writ, that the famous saint alluded to, fed on "locusts and wild honey;" and perhaps a good many people imagine that it was the insect, called locust, and not vegetable food, on which St. John regaled himself.

The Acacia is a Tree of very rapid growth, and the timber accordingly suffers, as is generally the case with rapid growers, and although it

was at one time considered to be superior to Oak, and has some of the Oak qualities of hardness and toughness, it is much more brittle than that

Fig. 23—Leaf of Acacia (*Robinia pseud-acacia*)

of the King of the Forest, and, when high winds prevail, branches are snapped, with the result

that the winter form of the mature Tree is often

Fig. 24—Bole of Old Acacia (*Robinia pseud-acacia*).

seen to be much more rugged and picturesque than graceful.

Our illustration of this form (page 44) from one of the best preserved Trees in Kew Gardens, will at once indicate what is meant. One bole shown (page 41) was photographed from a very old Tree, in the same gardens, but the upper part of this particular Tree presents features of sylvan ruin. For posts, fences and sills of doors, the wood of the Acacia is believed to be more enduring than Oak. It is also used by toy-makers as a substitute for boxwood. The leaves are, as shown, arranged in opposite pairs of leaflets, each leaflet borne on a short stalk, and the pairs stand out very gracefully from the midrib or rachis, one leaflet terminating the latter, the form of the leaflet being what is termed oval, or egg-shaped. The sweet-scented flowers are white and are borne in racemes, or clusters, the word raceme meaning a cluster, or branch, as a bunch of grapes. The leaves, in colour, are usually a golden-green. Like the Laburnum, which the Acacia much resembles in the form of its leaves and flowers, the resulting fruit or seed is contained in long pods, or "legumes." The word "legume" is applied generally to seed receptacles of the same kind, such as those of the pea and bean, and it comes from a word meaning "that which may be gathered." The order of plants called *leguminosæ*—including the Acacia—is a very large one amongst the dicotyledons: and its designation arises from the fact that the seeds of all the plants comprised within it are enclosed in pods similar to those of the pea and bean. Comprehended within the order are some of our most beautiful and graceful Trees and shrubs.

Fig. 25—Bole of Acacia.
(Robinia pseud-acacia).

There are several ways in which the Acacia may be propagated : —by seeds, very readily ; by

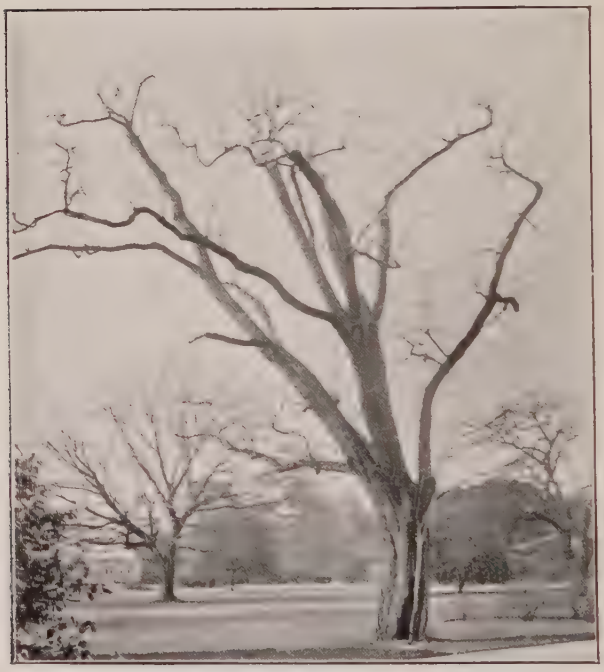


Fig. 26 WINTER FORM OF ACACIA *(Robinia pseud-acacia).*

grafting, and by cuttings either of the branches or roots. Talking of roots, it may be mentioned

that the Acacia possesses a proclivity, common to some other Trees, yet wholly unexplainable—for the roots extend horizontally close under the surface of the soil; and that accounts for its rapidity of growth, for the obvious reason that the "top soil," as it is called, of any ground, is usually the richest in leaf mould, and frequently more continuously moist, during seasons of slight rain not sufficient to penetrate to any depth. All shallow-rooting plants are quick growers; but what is it that causes one plant to send out its feeding agents—the roots horizontally, and impels another to send them deep down in the earth? This is one of the interesting mysteries of nature that our boasted "science" can tell us nothing about.

2.

ALDER.

(*Alnus glutinosa*).

MUSIC from running water; or the gentle "plash," in deep flowing currents, of

Fig. 27.—Leaf of Alder (*Alnus glutinosa.*

the "rising" trout; the rustle of leaves, responsive to the touch of the soft summer

breeze ; the gentle "lowing" of cattle in river-side meadows—are all reminiscent of the Alder, which though genuinely and veritably a Tree,

Fig. 28—Naked Spray of the Alder.

is most familiar to the holiday wanderer as a shrub. But first of its leaves, the mere thought of which is cooling and refreshing ! Incidentally

it may be mentioned that they are amongst the last to succumb to the influence of autumn ; and that circumstance is probably accounted for by the pervading moistness of the atmosphere that surrounds them.

Alder leaves have a striking personality, so to speak—the curious depression in the top giving them a distinct and noticeable character. Their outline is heart-shaped, and the veins beautifully branch off at acute angles from each side of the midrib to the serrated, or saw-edged, margin of the leaf. The venation or system of veins is prominent- a network of reticulating veinlets running between the principal veins. The dark green epidermis is glossy, and, to the touch, the leaf surface is sticky. Hence the specific botanical name, *glutinosa*.

Under especially favouring conditions the Alder may attain a height of 60 feet. It also grows rapidly, and our illustration of a bole of this Tree shows the quite respectable dimensions to which it may attain. In the first ten years it may reach a height of 25 feet. Like all rapid growers, as already indicated, its wood is not of great value, being too soft ; but it is utilised by the cabinet-maker and turner for sundry household articles. For the particular use to which its waterside habitats would appear, naturally, to adapt it, namely for foundations of bridges, and for piers, it is very valuable : also for the staves of water and herring barrels. In France it is used for "sabots," and these, curiously enough, are smoked to render them

harder and impervious to the attacks of the larvæ of a small beetle. The same insect attacks

Fig. 29—Bole of Alder *(Alnus glutinosa)*.

it, later on, when it is manufactured into articles of furniture, but its raids are anticipated, and

prevented by soaking the wood for a short time in lime water, and then varnishing it with French polish. After this process it will endure, unharmed, for a great many years. The process of soaking Alder timber in peat bogs makes it turn as black as ebony; and, for the ordinary purposes of manufacture, old wood, without the bog-immersion treatment, makes very handsome tables, its knottiness giving it the appearance of what is called curled Maple. It is also said to make better weather boards than Elm or Beech.

Alder roots are remarkably spongy and succulent, and they have the curious power of attracting moisture more than those of some other Trees; and, when a number are growing together, they almost form a swamp- a beautiful method of nature for providing the especial conditions essential to it. Its flowers are produced in drooping catkins, a species of spiked inflorescence familiar to most people in the flowers of the Hazel and the Poplar. The seeds are contained in little cones, which open, when ripe, to allow the seeds to drop the cone usually remaining on the Tree.

A note in conclusion as to the meaning of the popular name. It is derived from two celtic words *al* near, and *lan*, the border of a river, a very appropriate designation.

3.

ALDER BUCKTHORN.

(*Rhamnus frangula*).

WITH less claim to Tree honours than the Alder, the Alder Buckthorn attains a height of ten feet in our woods, and probably, in other parts of the World under other conditions of growth, may be much larger. Indeed, in North America, a relative of this Tree does reach to forty feet; but it has not been possible to furnish a bole worth figuring. Nevertheless it is an interesting plant. Its generic name of *Rhamnus* is derived from a Greek word meaning Buckthorn or Christ's Thorn, and the specific name *frangula*, which means breaking, is applied to it because of the brittleness of its branches. It is also popularly called the Berry-bearing Alder. Its leaves are what is called entire, or not crenated, and they are oval in shape and small, but are prettily veined in a manner somewhat similar to those of the Alder, and that is, probably, the only excuse for giving it a sort of namesake designation; but the shape of the leaves is distinctly different from those of *Alnus glutinosa*. They are pointed and not depressed at their extremities.

Bees are especially fond of the white and purple-anthered flowers of the Breaking Buckthorn, whose deep purple berries are features of beauty in the Autumn.

Common in England, it is rare in Scotland. The berries have been used for dyeing yellow and the bark for a tawny dye ; and both bark and berries are purgative. Each berry contains two large seeds and is distinguished by this feature

Fig. 30—Alder Buckthorn.
(*Rhamnus frangula*).

from the Buckthorn berries, which contain four seeds. A notable character in the dyes obtainable from *Rhamnus frangula*, consists in the unripe berries making wool green and yellow, whilst, when ripe, the dyes are blue, blue-grey and green ; and, with a preparation of iron, they make a black dye. The best charcoal for gunpowder is also made from the wood : so that our present subject serves very useful purposes.

4.

APPLE.

(*Pyrus malus.*)

HOW many people know—familiar as they are with the scent of the Rose and the perfume of the Apple—the perfume, we

Fig. 31—Leaf of the Apple (*Pyrus malus*).

mean, of the fruit in the case of the latter that they are both members of the great order of

plants botanically named *Rosaceæ*—that they are, in fact, relations? Yet, so it is.

The species which this chapter deals with is

Fig. 32—Naked Spray of the Apple.

the normal form, from which there are a vast number of what are called "departures" or variations from the normal form. But the variations

are most strikingly different in the fruit, that is, in its size, shape, colour and flavour.

Pyrus malus is the wild apple, and though charmingly picturesque in appearance, is widely different from the hosts of relations made sweet, juicy, and luscious by the familiar process of grafting. The generic name *Pyrus* comes from the latin *pirum*, a pear; and the feminine *pirus*, a pear tree, has doubtless originated the term *Pyrus*—the genus of Trees under that name including the bearers of an interestingly-large number of edible fruits. *Malus*, in Latin, means an Apple Tree, and probably the common name of apple derives its origin from Abella, a town in Campania abounding in fruits of different kinds. Probably also—but this is a mere surmise of the present writer—the most abundant of the fruits of Abella was the apple, and hence, it may be, why to this particular fruit the name has adhered—for Abella would very soon become corrupted to "Apple."

How to get a typical representation of the often crooked and contorted trunk and limbs of this Tree would be a task of considerable difficulty, because its variations in form are so numerous, and the photograph, engraved for this chapter, has been taken by the author, haphazard. But anyone desirous of studying the divergent forms of trunk and limbs need only pay a visit to almost any orchard. When young, the limbs take a horizontal direction, but, as age advances, they droop more or less, for a very sufficient reason, borne down as they are each season by the weight

of fruit. Certain diseases and the irregular attacks of insects, also, in time affect the bark and the inner wood, and materially change the appearance of the whole.

A very simple leaf is that of the Apple, oval or egg-shaped, pointed at the apex and serrated. The veining is most interesting, wavy branch veins, or veinlets, going off from the midrib and irregularly forking to the leafy margin. It is noticeable that the undersides are paler in colour, and this, by the way, is the case with many leaves owing to their being more sheltered underneath from the colouring force of sunlight ; but in the Apple undersides, the wonderful *stomata*, already alluded to, as existing in such vast numbers, carry on their marvellous and beautiful work.

The blossoms are fragrant and white but tinged with pink, a feature that distinguishes them from the inflorescence of the pear. Each flower has five petals, and the flowers themselves are borne in clusters on the twigs. As to the resulting fruit, an easy mark of distinction from that of the pear, is the depression at the apex, which is always concave, whilst the pear is convex. "Pomatum"—a very old-fashioned hair-lubricant was so called because it is believed that at one time it had, with lard and rose water, an admixture of apple pulp *pomum* being the Latin for apple, whilst *pomme* is the French for it. The word "pomade" is the more frequently-used expression to indicate a preparation for the hair ; but various flower essences are ingredients in its manufacture.

Of the wood of this popular and favourite Tree,

Fig. 33—Bole of the Apple (*Pyrus malus*)

it may be said that it is very useful in the arts—brownish in colour, fine-grained and hard. It was more used, in former times than now for turning into various articles, such as wheel caps, and for other articles where durability was essential, and on the Continent of Europe, it is not unusual to find "live" hedges formed of wild apple Trees. Apple bark is capable of producing a yellow dye, and vinegar, as may readily be believed, can be made from the sour juice of the crab.

Many years ago, the present writer, defended the Apple Tree from the charge of want of picturesqueness, and he remarked that "such (the accusers) must be strongly unconscious of the fresh verdancy of its glossy leaves, the fragrant wealth of its blushing flowers, and the mellow charm of its ruby and golden fruit. And if it can—and it surely may—borrow an added charm from the beautiful vegetation that clings to it for shelter and protection, who can gainsay the picturesque attractions of the white-fruited mistletoe, and of the white and gold of encrusting lichens."

He may now ask whether it can be denied that country villages would lose half their charm if denuded of the beauty of their apple orchards, resplendent in spring with sweet-smelling blossoms, and the golden green of leaves, and redolent in the autumn with the pervading perfume of the ripened fruit. Tastes may differ, but the author knows of no more delicious smell than that which loads the whole atmosphere at night, when the picked fruit is heaped up on the ground ready for the market salesmen and the cider press.

5.

ARBUTUS.

(Arbutus unedo).

THE appellation of "The Strawberry Tree" will make the beautiful subject of the present chapter better known, although the generic latin name is very widely used as the common one; but it is the striking colour and appearance of the fruit that has given rise to what may be called its descriptive name, so much does it, at a little distance, resemble the luscious strawberry of the garden. As the fruit of the Arbutus is ripe late in the year, it is sometimes called "The Winter Strawberry." In this country it only attains a small size, and is usually just big enough to be called a Tree, rarely reaching a greater height than thirty feet. Its leaves are dark, glossy and evergreen. The white flowers are vase-shaped and deep, and hang in "racemes." A "raceme" is a cluster of blossoms, arranged upon "pedicels" (or little stems, derivation from the latin pes "a foot") around a common or main stem, and the resulting fruit is scarlet and of round cherry-shape. Insipid to the taste in many cases, it has more

flavour in some soils than in others, and in Killarney, where it grows wild, it is said to be greatly superior to the fruit of the cultivated plant.

Fig. 34—Arbutus (*Arbutus unedo*).

Arbutus wood is dark and is ornamented by darker lines, and in its native country Killarney, it is manufactured into ornamental boxes and toys, which are sold by the poor people of the

country. The bark of this Tree is very smooth and striking in appearance. The species of which we give an engraving is, *Arbutus unedo*—our native species.

Insects moths, butterflies, bees and wasps are very fond of the flowers of the Arbutus on account of the honey which they contain. Indeed, sugar and spirit have been extracted from the berries.

6.

ASH.

(*Fraxinus excelsior*).

NOT inappropriately has the graceful Ash been called "The Venus of the Woods," and it may be claimed for this really beautiful Tree that it has as much right to the appellation as the Oak has to be styled "the King of the Forest." In "Our Woodland Trees" the present writer said of the Ash: "By its fondness for the stream-side, for the crests of inaccessible crags, for some jutting point of the steep upland, or for the conspicuous vantage ground of some crumbling ruin, it is enabled, by its preference for a shallow soil, to display the lightness and grace of its foliage to perfection."

As already stated in this volume, the shallow rooting of a Tree, for a reason given, produces rapid growth, and the Ash, on this account, is a rapid grower, quickly overtops its woodland rivals, and, oftentimes, rises to a considerable height—to as much as and probably sometimes more than eighty feet. So near do its roots come to the surface in their horizontal progress that they render it difficult for any surface vegeta-

Fig. 35—Leaf of the Ash. (*Fraxinus excelsior*).

tion to thrive a circumstance that probably accounts for an old belief that the "drip" from an Ash Tree is fatal to other plants. It is late in coming into leaf, generally later in fact, than any

Fig. 36—Naked Spray of the Ash.

other tree; but it is not inactive in the period preceding the leafing; for the flowers, in purple clusters, appear in advance of the foliage and are especially noticeable for that reason; but the

Fig. 37. -Bole of the Ash. *(Fraxinus excelsior).*

inflorescence as it is termed—is produced without a calyx—the green outside cup of the blossom—or corolla, the inner cup, or coloured fence, so to speak that surrounds a plant's most important part—its seed, the beginning of future plants. The inflorescence, however, consists of stamens, the male pollen-bearing and fertilizing part of a flower, and pistils, the female organs that attract and convey the fertilizing pollen to the seed, to give the latter its vitality and that mysterious power that enables it to go on and develop into future plants. When the anthers- the pollen receptacles of the stamen have conveyed their fertilizing dust to the stigmas and thence to the ovaries, or seed vessels, the latter begin to enlarge and, when they have attained a natural size, they are found to be flat, wing-like-bodies, the wing shape adapting them, later in the year when the seeds are ripe, to fly away on the crests of the wind —a method beautifully adapted to secure a proper distribution of the seed in positions where it may have a chance of germinating.

A pretty and graceful leaf is that of the Ash, as our illustration will show, the mid-stem having five or six pairs of leaflets disposed along its length in opposite pairs with one leaflet at the end, making a graceful termination. Occasionally it may be noticed that there is no terminal leaflet. The form of each leaflet is oblong, broad at the base and pointed at the apex.

Ash-wood is valuable for a variety of purposes for axletrees in olden times for bows and spears —for barrows, carts, ladders, oars, plough

Fig. 38.—Winter form of the Ash (*Fraxinus Excelsior*).

stocks, pulley blocks, tables and tool handles. For toughness and elasticity it is superior to Oak

and therefore it is largely used by the coachmaker, by the manufacturers of agricultural implements and by the wheelwright. Knotty parts of the timber are valued by cabinet makers, especially when, as is often the case, it is elegantly veined. Amongst other uses it may be mentioned that Ash-wood is valuable for basket handles, bowers, crates, hoops, hop poles, hurdles and walking sticks.

In Bidlake's "Year" is a fitting description of our present subject. The author says:—

"The Ash asks not a depth of fruitful mould,
But, like frugality, on little means
It thrives; and high o'er creviced ruins spreads
Its ample shade, or in the naked rock
That nods in air, with graceful limb depends."

7.

BARBERRY.

(*Berberis vulgaris*).

FAMILIAR by sight to a great many wayside wanderers who might not be able to give it a name, the Barberry, with its yellow wood

Fig. 39.—Leaf of the Barberry.

(Berberis vulgaris).

and thorny stems, is a pretty plant, common in most hedgerows, and although usually seen only as a shrub, it attains, under favourable conditions, a

height of thirty feet, notwithstanding that in

Fig. 40.—Leaf Spray of the Barberry
(Berberis vulgaris.)

botanical treatises the height is given as being

from four to six feet. Moreover it has been known to live for two or three centuries, a respectable period in plant age. The common name, which is sometimes spelt "Berberry," is, according to du Theis, the Arabic name for the fruit of the plant: but "authorities" are mostly reticent in the matter of this nomenclature.

The leaves of the Barberry are somewhat striking- oval in shape—what may be termed bluntly -oval; but the reticulation of the veins is extremely elegant, the acute serratures of the edges—which are botanically described as "serrato-ciliated" giving, to use an apt illustration, the impression of eyebrows. The pale bristles on the points of the serrations being pointed forwards, enable the leaves to be easily identified. Their green colour is of a yellowish tint. The trios of thorns on the twigs give it a distinctly thorny appearance, and as thorns are supposed to exist for the protection of fruit, it may be that this character may have had something to do with the origination of the common English name, if we could suppose it to have been bar-berry. In any case many names of plants, animals, fish and insects have no more than similarly-fanciful reasons for their origin.

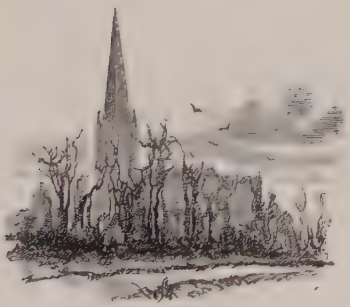
Barberry flowers are yellow, the colour which prevails amongst its garden varieties, such as the *Berberis aquifolium* and *Berberis darwinii*. They are borne in "racemes," each flower having a calyx of six coloured concave pieces, enclosing a corolla of six pieces. There are also six stamens in each blossom, and these have the peculiarity

that they are sensitive to the touch. Other stamens in other plants have the same peculiarity, the sensitiveness being noticeable in the kinds which are self-fertilizing, that is, which contain, in the same plant, male and female organs.

This is one of the wonderful and beautiful mysteries of nature. Many insects, in seeking the sweet pollen of a male flower which is unisexual, possessing only the male organ, carry away on their bodies some of the fertilizing dust to another unisexual plant which possesses only the female organ, and are thus the unconscious agents of fertilization. The wind sometimes performs the same office by blowing pollen from a male to a female plant. In other cases insects may serve to fertilize a bisexual plant, or one that contains, in the same individual, the stigma, or male organ, and the pistil or female organ. In other cases again, as in that of the Barberry, nature makes the plant independent of a carrier, so to speak, and provides a supersensitiveness which causes a mere touch, whether of an insect or anything else, to make the anther-containing pollen vibrate. The slight concussion shakes off some of the pollen on to the stigma underneath.—Who can explain this wonderfully interesting automatic power?

Barberry fruit consists of berries oblong in form —larger at the base than at the apex—and they ripen into a brilliant red colour and hang in beautiful clusters, adding much to the general elegance of the plant. Barberry wood, as already stated, is yellow—it is also brittle—and from it a

yellow dye can be extracted. Fruit and leaves are acid to the taste. The berries, preserved in vinegar, may be eaten as capers are eaten, or, preserved in sugar, they make an agreeable food. The plant is a rapid grower, and can be propagated either by its "suckers," or offsets from the roots, or by its seeds, which readily and quickly germinate. The entire Tree, as we may fairly call it, whether of shrub-size or larger, adds a distinct and striking feature of beauty to wayside and forest.



8.

BEECH.

(*Fagus sylvatica.*)

THE prominent and striking feature of beauty in the Beech, is its bole, where silky smoothness of bark and picturesqueness of form, are combined in a manner that probably no

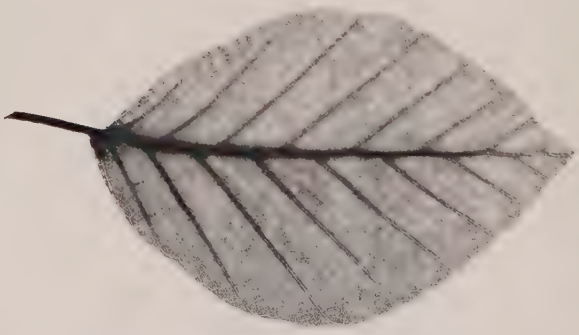


Fig. 41.—Leaf of Beech (*Fagus sylvatica*).

other Tree can rival. In connection with the smoothness of its bark, that has tempted so many people to engrave names and dates upon it, and, years after, to note how the words or figures have

grown with the growth of the Tree, it will be interesting to mention, that formerly the wood of the Beech was made to serve for the covers of books, and even for use for writing words upon: so that the word Beech from the Saxon "bece," the Swedish "bak" and the German "buche," came to be corrupted into "book" in all probability. The generic name Fagus is from *phagō* to eat, referring to its eatable seeds.

Beech leaves are things of beauty, covered in their young stage with silky down, which disappears as they merge into the dark green glossiness of their mature stage. They are symmetrically oval in shape, pointed at their tops and fastened to their stems by short stalks. The venation is beautifully regular, and can be very prominently seen, especially on the undersides. On each side of the midrib, continuing the leaf-stalk, the veins proceed in straight lines to the apex of the leaves, veinlets branching in parallel lines to the unindented but wavy margins. The substance of the leaf is thin and hard. The conical buds, precursors of the leaves, are long and pointed and furnish a distinct mark for identification. The flowers are of two kinds, barren and fertile, the former, brown in hue, three or four being produced together in drooping heads, whilst the fertile ones, precursors of the edible nut, are produced singly. As soon as the fertile ones have done their work of fertilization, they drop from the Tree, and may at the proper season, be easily recognized, scattered on the ground. The resulting nut is triangular

in shape but four-valved, the seed vessels being covered by blunt prickles. The nut is pleasant

Fig. 42.—Naked Spray of the Beech.

to the taste and an especial favourite with the agile squirrel. It is a curious feature of beech

"mast," as the nuts are styled, that they do not long retain their power of germination, and, if

Fig. 43.—Leaf Spray of the Beech (*Fagus sylvatica*).

desired to grow, they should be sown not later than the year succeeding their production.

Beech wood is famed the world over, for its utility. It is harder when green and young than

Fig. 44.—Naked Bole of the Beech (*Fagus sylvatica*).

the wood of any other British Tree, and when grown on good soil, has a reddish tinge, but

when in more "hungry" soils, such as chalk, which it loves, it has the white colour, which

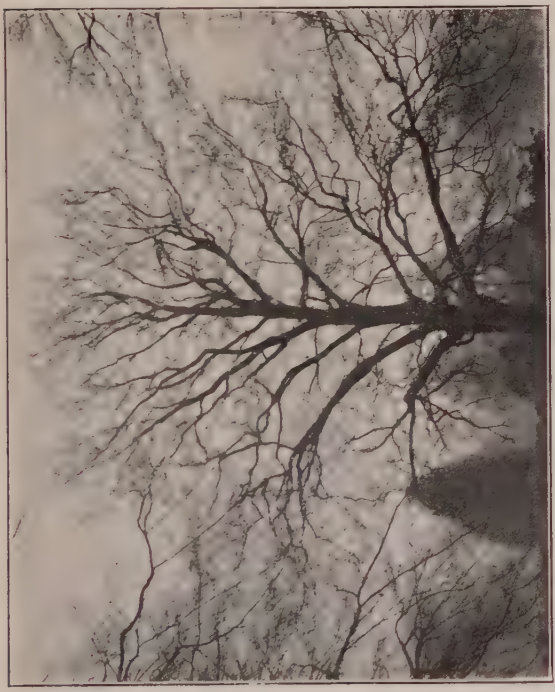


Fig. 45.—Winter Form of the Beech (*Fagus sylvatica*).

causes it to be esteemed for many purposes of the cabinet maker. It can be made more durable

by steeping in water. Its uses for manufacture are too numerous to give in detail; but it is pretty well known how largely it is employed for articles of household furniture—chairs, tables, bedsteads, and numerous other articles required for domestic purposes, such as teapots, jug-handles and bowls, wardrobes, corn measures, chests of drawers, desks, and boxes of all kinds. Where wood is largely consumed for fuel, that of the Beech has a peculiar value, as it burns readily and throws out a great deal of heat.

Those who have seen the unrivalled Beech woods of the New Forest "new" no longer, in Hampshire, especially in Mark Ash, will easily recognize that the most eloquent descriptions of the picturesque beauty of the Tree are no exaggeration, and will recognise that it is as beautiful as it is useful.

9.

BIRCH.

(*Betula alba.*)

COLERIDGE very appropriately called the Birch "The Lady of the Woods," and if there be a "poetry of motion" in the movement of Tree leaves, when touched by the soft

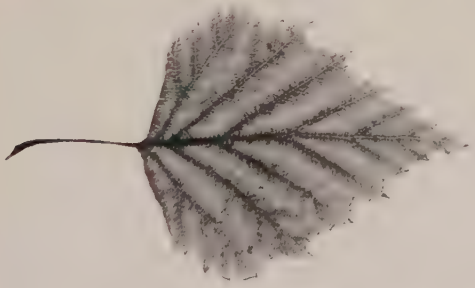


Fig. 46—Leaf of the White Birch (*Betula alba*).

breezes of summer, it can surely be claimed by this charming inhabitant of the forest; for none can establish so good a right to be regarded as the embodiment of gracefulness, as the interesting

Fig. 47—Naked Spray of the Birch.

subject of our present chapter! The Anglo-Saxon *beorht*, meaning bright and shining, may probably be given as the origin of the common name, in-

dicating as it does the character of the Tree; for its white bark and bright glossy foliage are likely to have given the idea of an appellation that would be appropriate to it. Usually it is a small Tree, not often exceeding four or five feet in circumference; but there is a peculiar charm in its light and elegant spray and in its graceful and pretty leaves—"twinkling," as do those of the Poplar, with the least motion of the wind. The form of the leaves is what is called deltoid-rhomboid, and they are sharply serrated on their margins, and go to an acute point at their apices. The venation is especially prominent, the veins proceeding with great regularity from the midvein to the indented curvatures of the leaf edges. They are borne on long and thin footstalks, and it is this fact that makes them so easily responsive to the slightest movement of the wind. Their glossiness is an especial feature of distinction.

The White Birch, as the specific name of *alba* denotes, is noticeable by the white blotches on the bark, as our illustration will show in the Birch Bole figured. Another species *Betulus papyrifolia*, also shown by an engraved photograph, is much whiter in its bark than *Betula alba*, and is more entitled to the specific botanical name of the last-named; but the third bole illustrated, that of *Betula nigra*, the River Birch, deserves its specific name so far as its bark is concerned, because that is of a very dark hue. Both *papyrifolia* and *nigra* are usually seen only in private or public grounds where they have been planted. The White Birch, however, is very familiar and is

found in almost any wild wood in this country. There is also a not uncommon weeping variety of

Fig. 48 – Leaf Spray of White Birch (*Betula alba*).

Betula alba. The spray of all the Birches is so fine and delicate and is so easily moved by the slightest

breath of wind, that the Trees are very difficult to

Fig. 49—Bole of the White Birch *(Betula alba)*.

photograph, except when the air is perfectly still.

Insects are very fond of Birch leaves, and the buds, and catkins of barren flowers, are devoured

Fig. 50.
WINTER FORM OF THE WHITE BIRCH (*Betula alba*).

by numerous birds. Birch seeds, too, are edible, and cattle feed not only on the leaves, but on the

Fig. 51—Bole of the Paper Birch

(Betula papyrifolia).

Fig. 52.
WINTER FORM OF THE PAPER BIRCH (*Betula papyrifolia*).

young shoots. The seeds readily and rapidly grow, and young plants may be found in many woods. The wood of this Tree is greatly esteemed, and

Fig. 53.—Bole of the Black Birch.—*(Betula nigra).*

serves for a variety of uses. The spray is useful for bad boys, and the "birch rod" is a terror to many a school boy. It also serves—the spray—

for brooms. The timber is white in colour, shaded with red, and one advantage it possesses, is that it is very hard—harder than many other Trees. It makes good fuel, burning with a bright flame, and produces a particularly excellent charcoal. It is used by wheelwrights, and for chairs, and many other kinds of furniture; for turning purposes, for the staves of casks, and on the Continent for *sabots*, or wooden shoes. The cabinet-maker does not utilise it ordinarily until it has attained an age of from 60 to 80 years. The bark is singularly good for resisting damp, and therefore the trunks and thicker limbs are valuable, when left with their bark on, as stakes for land or water. Even the ashes of the Birch are valuable, as they are found to contain a good deal of potash. Few Trees therefore can claim to be more useful and beautiful than the Birch.

10.

BIRD CHERRY.

(*Cerasus padus*).

AS its common name indicates, the fruit of this little Tree, which rarely attains a height of more than forty feet, is greedily eaten by birds. Insects also are fond of its leaves: but its berries, beautiful to the eye, are nauseous to human beings. The flowers in appearance are like the more familiar "Cherry Blossoms" of the orchard. They are borne on racemes, are pure white (in colour, as naturalists sometimes say, forgetting that white is not a colour) and each flower contains five petals. The cherries are usually black, although there are varieties with red fruit; but all are bitter, and it must be that bitterness is not a quality disliked by birds. Probably they are unconscious of it—a curious circumstance that illustrates the extraordinary variation in "tastes." Inside the "flesh" of the berry is the hard "stone," or kernel, containing the softer seed. The nut, as the stone really is, is corrugated.

The Bird Cherry is a rapid grower, and will attain a height of 12 feet in 5 or 6 years.

giving an annual growth of two feet. The bark of the branches is purplish in colour and spotted with white. The leaves are things of beauty, as our illustrations of a spray of leaves will indicate. They are egg-shaped, and have indented margins, and a very beautiful system of veins, which proceed with marked symmetry from the mid-rib to the leaf edge. The prominent footstalks are purple in colour.

A curious indication of the especial fondness of caterpillars and other insects for the leaves is given by their leaving other Trees when Bird Cherry leaves are near, so that it is found to be a good plan to place this plant amongst other fruit Trees.

The wood in its young state—like the leaves and fruit—is bitter to human taste. It is hard in texture and yellow in colour, and is utilised by the cabinet-maker in various ways. By sawing out the boards diagonally, or obliquely across the trunk, the beauty of the veining is shown to more advantage. In parts of the Continent of Europe a strong spirit is made from the bruised fruit, after fermentation. The juice is believed by some people to give an agreeable flavour to brandy, and also to wines of home manufacture. As to the fondness of animals for the leaves of the Bird Cherry, it is a curious fact that whilst they are readily eaten by cows, goats, pigs and sheep, horses will not touch them, an indication, perhaps, of the higher organisation of the horse.

It has been recommended to agriculturists,

as a protection against the raids of insects, to plant, when laying out orchards, one Bird

Fig. 54.
LEAF SPRAY OF THE BIRD CHERRY (*Prunus Padus*).

Cherry in every square of 100 yards. Garden lovers might adopt the same plan, and thus

prevent the devastations of caterpillars; although, as the Bird Cherry is only used in gardens, lawns, and plantations, as an ornamental Tree, the object of such ornamentation will be largely discounted by the resulting disfigurement of its leaves.

The Bird Cherry is found growing wild all over England and Scotland, but is most abundant in the last-named country and in the north of England.

11.

BLACKTHORN.

(*Prunus spinosa*).

FEW plants have a better or more appropriate common name than the interesting subject of this chapter: for its wood is dark and prickly, and even its foliage has a dark-green hue. The botanical name is similarly good—*prunus* meaning a plum Tree, and *spinosa* from the latin *spinosus*—"full of thorns" indicating, quite accurately, its extremely prickly character. Everyone knows that the French *prune*, a name now thoroughly anglicised, means plum, although, with us, it is only used to describe dried plums, or plums preserved in sugar: but it is not everybody who knows that the wild and sour "sloe," the fruit of the Blackthorn, is the progenitor of the delicious plums of the garden. In the very early spring, and often before the snows of winter have disappeared, many hedges in the country are white with its flowers, generally produced singly or in pairs and without perfume. The petals are five lobed and campanulate, or bell-shaped—the petals being joined together at their bases, but the anthers, or pollen bearers,

are orange-coloured. The "bloom" on the succeeding fruit is a well-known feature of the sloe, and gives great beauty to it. The same character clings to the garden descendants of the wild plum—descendants which by cultivation, lose the extreme and "biting" acidity of the hedge-side shrub or Tree—for Tree it becomes under favouring conditions, rising sometimes to a height of thirty feet. The roots creep extensively along the ground, near the surface, and throw up "suckers," as do all the plum-tribe of our gardens—these also, like their wild congeners, producing their blossoms before their leaves.

For the reason stated, the Blackthorn soon makes a matted and tangled thicket in the hedge bank, and is much used for fencing—although for the latter purpose, the branches of the sweet smelling hawthorn are preferred by the husbandman.

As illustrating its capacity for travelling along under the surface soil and multiplying itself by "suckers" so called because they suck up the surface nutriment—it may be mentioned that a single Blackthorn, would, if undisturbed, cover an acre of ground in a comparatively short period of time— a few years.

The leaves of this plant are produced, as our illustration will show, in little clusters, and may be likened somewhat to rosettes. The mid veins give off wavy branches to the finely-serrated leaf margins. The form of each leaf is oval, its colour a dark dull green.

Perhaps the best known use of the wood is for

walking sticks, as it is hard, although prone to crack, and can be easily polished. It is, however, also used for tool handles, and for teeth for hay

Fig. 55—Naked Spray of the Blackthorn.

rakes: also for other "small purposes," as, although so abundant, it is seldom found, growing wild, large enough to manufacture into articles

of any appreciable size. Another use of the thorny branches is for what are termed "dead" hedges, that is hedges formed, not of "live"

Fig. 56—Leaf Spray of the Blackthorn.
(Prunus spinosa)

plants of which hawthorn hedges are usually made to consist, but of the dried and dead tangle of twigs. The thorny character of the latter

makes them especially useful for fences, of which, of course, hedges are the chief, and it would make them more useful if it were known that wounds from their thorns do not heal so quickly as flesh wounds from the hawthorn. The dead branches of the Blackthorn also make excellent fuel. A decoction of Sloe leaves is not unlike tea, and it may therefore not be surprising to learn that these leaves are used as adulterants. "Port Wine," the taste for which is answerable for so many sins, and is a name that does cover a multitude of sins —much of the beverage so named being quite innocent of any connection with the grape—is also manufactured—although in all probability not largely from ripe sloes, and, when treated as spurious manufacturers know how to treat it, the taste of the liquid is not unlike new port wine.

Finally, it may be added, that a decoction of Blackthorn leaves is found to be mildly purgative, and that from the bark can be produced tannin, ink, and a yellow dye.

12.

BOX.

(*Buxus sempervirens*).

THOUGH ordinarily seen as a shrub, and used, in its smallest forms, for garden edgings, a use for which its neatness and compactness make it very suitable, the well-known Box is nevertheless deserving to rank as a Tree, and produces timber that was much in requisition by the engraver in wood, but has now been largely—indeed almost entirely—superseded for illustration purposes by the *photo-gravure* and other "processes." Some of the largest Trees in these islands grow wild on Boxhill, in Surrey, but the plant is not by any means widely distributed, except for the somewhat artificial purpose already referred to—that of "edging." There is little doubt that it is an indigenous Tree, although it is not often seen growing higher than 20 feet.

Its leaves, carefully examined, are found to be very pretty, the venation being specially and symmetrically regular, and their evergreenness makes them refreshing all the year round, although the golden green of their spring hue is the most attractive. The leaves are mostly produced in regular

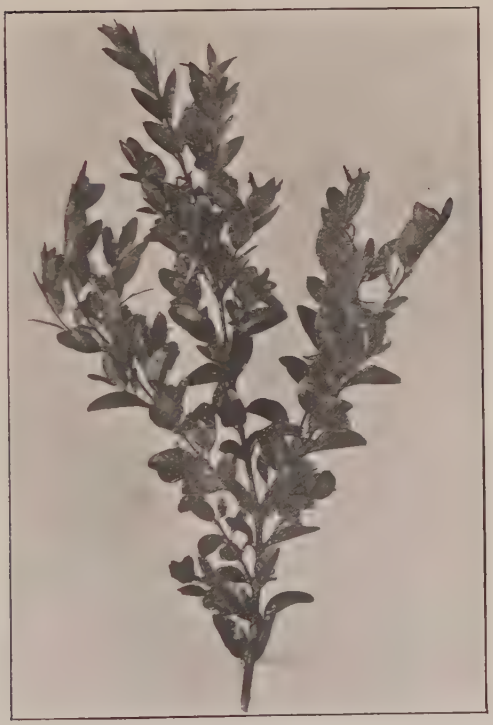


Fig. 57—Leaf Spray of the Box.
(*Buxus sempervirens*).

pairs on the principal stems of the branches. The edges of the leaf-stalks are slightly downy

The small flowers are of a yellowish white colour, and grow from the axils—or the angles formed by foliage on the stem, the root of the word "axil" meaning "an armpit"—of the leaves. They usually appear about April or May. The seeds are green, and generally ripe about the month of August.

Like all hard wood and many other evergreens, the Tree is of slow growth—an annual increase in length of six inches being about the most it makes. Boxwood is so heavy that it will sink in water like what is called iron-wood: but whilst the art of the wood engraver is in England almost a lost art, the turner and carver and cabinet-maker, put Boxwood to a considerable number of uses. Its colour is yellow, and it will take a fine polish. Innumerable toys and small articles for household use are manufactured from it. For many of these purposes it is found desirable, to improve the quality of the wood, to soak it in cold water for 24 hours and then to boil it.

Few plants are so hardy. It bears the clipping necessary, when it is required for edging, without injury, and mature Trees have survived a process that few Trees will stand, namely, the cutting off of portions of the trunk from time to time as the wood is required, leaving the stumps, which continue to live in spite of this treatment, in the ground.

13.

BOX ELDER.

(*Acer negundo*).

ITS maple-like leaf and character have probably determined the inclusion of this Tree in the genus *Acer*, and probably also, the form of its leaf may have given rise to the second part of its common name, for it is not unlike that of the Elder. It differs from the Maple leaf in being pinnate —a word derived from the latin *pinnatus*, which means feathered a pinnate leaf being one having leaflets arranged on opposite sides of a common stem, with a terminal leaf at the end of that stem. Another common name given to this Tree is that of Ash-leaved Maple, and this is justified by the foliage being like that of the Ash in the pinnate arrangement, the leaflets being also somewhat like Ash leaflets, but rather more like Maple leaves. There is a difficulty about the origin of the specific botanical name *negundo*, and there is a similar difficulty about the prefix Box in the common name. It may possibly have been suggested by the slight resemblance of the wood to that of the Box Tree.

The flowers, which are green and not conspicu-

ous, are borne on racemes ; but the fruit which is wing-shaped is easily noticeable from its size. Box Elder wood is fine in grain and saffron-

Fig. 58—Leaf of the Box Elder (*Acer negundo*).

coloured, with a tinge of violet, but as it is rather soft, it is only used by cabinet-makers for inlaying. Sugar, it is alleged, has been extracted from the

sap, and for fuel and charcoal it is useful. It grows with considerable rapidity in any soils suitable for Maples—that is, soils which are moist

Fig. 59—Winter Form of the Box Elder *(Acer negundo).*

and rich : it will grow to a height sometimes of 60 feet, but is not long-lived, and as an ornamental Tree. it has much to recommend it, both in regard to its shape and its handsome foliage.

14

BRAMBLE.

(*Rubus fruticosus*).

THE common Bramble, although it will sometimes grow to a height of 10 feet, has less claim than any other subject of this volume to be called a Tree, and can really only take rank as a Shrub, especially as it seldom assumes any other than a prostrate position; but it is so interesting and, in all ways, so beautiful a plant, that some brief mention may be made of it, in connection with an illustration of its pretty leaf. In this country, at least, whatever the tropics may do for it, the Bramble, although it has a woody stem, produces no "timber" and no "bole," that would be other than of insignificant proportions. It has a five-angled purple stem, leaves with from three to five ovate-oblong leaflets, rose-coloured or white, or pinkish-white, five-petalled flowers; and fruit which ripens into the luscious blackberry of the hedge, so well known and universally esteemed by thousands who have not taken the trouble to notice the form of the leaves or the shape of the blossoms. The Blackberry has been described as a gigantic

strawberry, and in some ways it does resemble the last named lovely plant, and it is possible that under some tropical conditions, the Bramble, with hugely-developed thorns and formidable trunk, might aspire to the full honours of a Tree. The fruit is somewhat astringent, and in addition to its familiar employment in pies, mixed with some apples to give a sharper flavour to the

Fig. 60 Leaf of the Bramble (*Rubus fruticosus*).

mellow sweetness of itself, it is used to make wine. There are a great many people, however, who have never tasted "Blackberry Wine," although it is manufactured in not a few country places, and makes a very palatable drink. In the same localties home-made "Blackberry Jam" finds favour, and indeed has made its way into the big jam manufactories for general use.

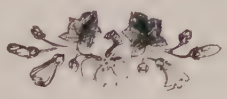
Gerard, the herbalist, recommended a "gargle" made of blackberry juice for the throat, and if of little medicinal value, it would certainly be more pleasant than many other "gargles."

So many woods furnish dyes, that it will not be surprising to learn that the green twigs of the Bramble have been used in making a dye; but, curiously enough, it is a black dye for mohair, silk and woollen materials. The shoots of this plant were also used by thatchers, and may be to this day, and for the weaving of the old-fashioned straw beehives. Their toughness recommends them for giving strength to this kind of manufacture, and in order to render them less liable to break, they were prepared by being drawn through a cleft stick -this plan being probably adopted to deprive them of their prickles -a very well and painfully-recognised feature of a bramble stem—and, so to speak, to "tone" them for the particular purpose indicated. Silk worms will sometimes, it is said, eat Bramble leaves, when no better food is available.

For the extraordinary and almost endless tints—strikingly observable in autumn—of the Bramble, it probably excels those of any other woodland Tree or shrub.

Gilpin, strangely enough, in spite of his confessed love for "the picturesque," disliked the Bramble, and described it as "the most insignificant of vegetable reptiles"; and the present writer was constrained, in his edition of "Forest Scenery," to put in a protest, and accordingly appended the following editorial note to Gilpin's

reference to the Bramble :—" Far from regarding it as 'the most insignificant of vegetable reptiles,' we confess a fondness for it, born, perhaps, of sunny recollections of schoolboy days and 'blackberrying.' Though the thorny, fruit-bearing shrub may owe us many apologies for scratched fingers or torn clothes, we can forgive it everything for the pleasure it has afforded us. But we feel that, apart from the influence of association, the Bramble has an undoubted claim to be considered picturesque. To our mind, indeed, forest clumps and forest underwood, would lose half their picturesqueness if deprived of this prickly trailer. Often too, we have seen it produce what Gilpin, with quaint simplicity, calls 'a good effect,' when, having climbed over the matted vegetation which canopies the space, midway between opposing hedgebanks, in so many of the 'green lanes' of western England, it has dropped its tendrils down through the mass of green, reflecting the sunlight from its young and glossy leaves. Need we speak of the attraction of its pretty blossom, of the charm of its coloured fruit—first green, then red, then black—or of the rich hues of its autumnal foliage."



15.

BUCKTHORN.

(*Rhamnus catharticus*).

WHILST not aspiring to magnitude of growth or attaining a height of more than fifteen feet in these islands, the Buckthorn is a very interesting little Tree. Its leaf is oval in shape, serrated on the margin with a prominent midvein and veinlets branching from it to the edge: but instead of going right across the

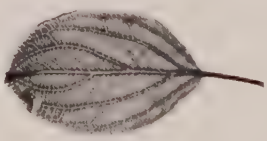


Fig. 61—Leaf of the Buckthorn (*Rhamnus catharticus*).

leaf with merely an upward tendency, it turns up conspicuously to the apex the direction along the leaf being longitudinal instead of diagonal. Its general hue is a dull green. The yellowish green flowers are four-petalled. They are borne in little clusters and result in round, black berries which are cathartic; and hence the specific name. The spini-

Fig. 62.—Leaf Spray of the Buckthorn.
(*Rhamnus catharticus*).

ness of its branches has probably originated its common name, whilst the generic name of *Rhamnus*

is of celtic origin, and signifies "a tuft of branches." It has been called —also probably on account of the sharpness of its thorns—"Ramthorn and Hartsthorn." Another name for it is "the purging Buckthorn," on account of its cathartic property. It is very plentiful in this country. The fruit is nauseous and violently purgative. The juice of the berries, when unripe, has the colour of saffron and has been used for staining paper; and the juice of the ripe berries will make a sap-green for painters. Curiously enough, when they are gathered late in the autumn, the colour of the juice is purple. The bark produces a yellow dye; whilst the inner bark, like the fruit juice, is strongly purgative, and, when taken inwardly, may cause vomiting. The flesh of birds that have fed upon the berries becomes bitter.

The trunk, or bole, is not often large—about the thickness of a man's arm—but its wood is hard-grained and of a reddish hue. All the species of *Rhamnus*, one of which -the Alder Buckthorn, *Rhamnus frangula*- has already been described in our alphabetical list, are easily propagated either by seeds or layers; and some of them by cuttings. They have a preference for arid or what is called "hungry" soils, including chalk. Under cultivation they exhibit a great variety in size. When covered with berries in the Autumn our present subject is very ornamental.

16.

CEDAR.

(*Cedrus deodara*).

THE two Cedars most frequently seen in this country, although neither is a "native," so far as is known, are the first subject of this chapter and the scripturally and historically famous Cedar of Lebanon. For wide-spread interest the last-named takes premier rank, but in our alphabetical plan of treating our Trees, *deodara* comes first. It is generally known as the Indian Cedar, or Deodar, which latter word may be translated as the Tree of God, or in Hindustanee as the Sacred Indian Fir. A rather considerable number will be found in the Royal Gardens at Kew, a former director of that beautiful botanical demain, having, so it is said, a great predilection for them; but the finest specimens of Cedars to be found generally in this country are the Cedars of Lebanon.

The Indian Cedar, in its native country, however, is a lofty and magnificent, as it is a most graceful Tree; and in the Himalayan range is often seen at a height of 150 feet with a girth of 30 feet, or 10 feet thick a diameter being

more readily appreciated for purposes of comparison than a circumference. Its branches,

Fig. 63 Leaf Spray of Indian Cedar (*Cedrus deodara*).

whether the Tree be small or large, are almost always very gracefully and symmetrically dis-

posed around the trunk, and their habit of

Fig. 64—Bole of Indian Cedar (*Cedrus deodara*).

drooping, which causes the lower ones to touch

the ground, gives them a very striking appearance. The bold character of the trunk, and the beautiful appearance of the leaves—needle-shaped as all the conifers more or less are—are shown in our engravings of bole and spray. The leaves are rather larger than those of *Cedrus libani*, are of a bluish dark green colour, and have upon them a "glaucous," from the latin meaning "sea-green," bloom. The male flowers are produced in catkins, are club-shaped, yellowish and tinged with a hue of red. The cones or seed receptacles are like those—of which we give an illustration—of the Cedar of Lebanon, but the latter are rather longer and also broader, the size of Indian Cedar cones being usually about four inches long, and varying in breadth from one inch to two and a half. The enclosed seeds are light brown in colour, and of irregular shapes, and are furnished with a large brown wing that, when the germ is ripe, enables it to take flight with the first breath of wind and plant itself away from the parent Tree in some congenial position.

It has been believed, by some authorities, that it was the wood of this Tree, and not that of the Cedar of Lebanon, which was used for the building of Solomon's temple. The timber is fragrant, hard and fine-grained, and possesses great durability. It has even been alleged that it is incorruptible; but an argument, and a strong one, against the assumption that this is the Cedar referred to in Holy Writ, arises from the fact that the Tree has never been found

Fig. 65—Indian Cedar (*Cedrus deodara*).

on Mount Lebanon, or anywhere in its neighbourhood. Nevertheless, it is venerated in India,

and when employed for the burning of incense, on account of its fragrance, it is only used on especially important occasions.

In Mr. Moorcroft's *Journal*, quoted in Lambert's *Pinus*, occurs the following most interesting evidence concerning the durability of Indian Cedar wood: "A few years ago," says the writer, "a building erected by the order of the Emperor Akbar was taken down, and its timber, which was that of the Deodar, was found so little impaired, as to be fit to be employed in a house built by Rajah Shah! Granting that the former edifice was constructed at the same time as the fort of Nagurunger, A.H. 1,006, or A.D. 1,597, its age must have been 225 years. Zenool Abudeen began to reign over Kashmeer A.H. 820, or A.D. 1,417; and died A.H. 878, or A.D. 1,475. His mother was interred in a domed building of excellent brick and mortar work reported to have been erected in the time of the Hindoo sovereigns. In this building pieces of Deodar were inserted in the walls, by way, apparently, of strengthening the bond; and their ends, or sides, were left on the same plane with the brickwork. The window-frames were of the same material, with the difference, however, of the former being squared, and deprived of their sap wood, whilst the latter, somewhat carelessly, had part of the sap wood left; and the surface was only slightly smoothed and partly retained in original form. In the latter instance, the crust of the wood was generally somewhat crumbly, and had

been pierced by a worm to about a quarter of an inch in depth; whilst that of the squared wood exposed much more to the influence of the weather, was neither crumbly nor worm-eaten, but was jagged from the softer part of the wood between the plates or ribs having been often washed by the rain, though its structure had not been attacked by the worm." This instance afforded a remarkable illustration of the durability of the wood of the Indian Cedar.

THE CEDAR OF LEBANON (*Cedrus libani*), around which gather the interest and glamour of all that is connected with Holy Writ, forms a picture of magnificence, to the mind, excelling in beauty and attractiveness that of the Tree itself, grand and impressive as its superb figure always is, second to none of all our Trees, and excelling them in its majestic and striking picturesqueness. Its magnificence and beauty of form are due to the singularly impressive and peculiarly symmetrical arrangement of its branches as they spread around its stem. They do not droop like those of the Indian Cedar, but stand out with extraordinary boldness at right angles to the upright trunk, and there is noticeable a markedly regular gradation in what may be described as the layers of branches from base to apex of the Tree.

Shakespeare in "Henry VI." gives a fitting poetic description of the Cedar: -

> "Whose arms give shelter to the princely eagle,
> Under whose shade the ramping lion slept,
> Whose top branch overspread love's spreading tree,
> And kept low shrubs from Winter's powerful wind."

Barry Cornwall, with similar force, says :—

——"on high the Cedar
Stoops, like a monarch to his people bending
And casts his sweets around."

And Southey indulges his fancy with singular correctness in the lines :—

——"It was a Cedar tree
That woke him from the deadly drowsiness ;
Its broad round-spreading branches, where they felt
The snow rose upward in a point to heaven,
And standing in their strength erect,
Defied the baffled storm."

Our illustration of a spray of leaves will give the best description of their needle-shaped form and disposition around the twig. They are what is called perennial or ever-green, but they drop off from time to time—about every two years. The expression "ever-green" means that there is a continual succession of leaves, new ones replacing the old, so that the Tree never has a leafless appearance. The reddish stamen-and-pollen-bearing flowers are borne on short catkins, but the pollen is yellow and very abundant. The pistil-bearing catkins, or female flowers, are shorter than the male, and rounder, and when they have been fertilised they develop into the erect, large, egg-shaped cones, produced singly on the twigs, of which we give an engraving. They are very hard and compact, the scales enclosing the seeds being pressed so closely together—as is the case with so many coniferous (or cone-bearing) Trees—that they look

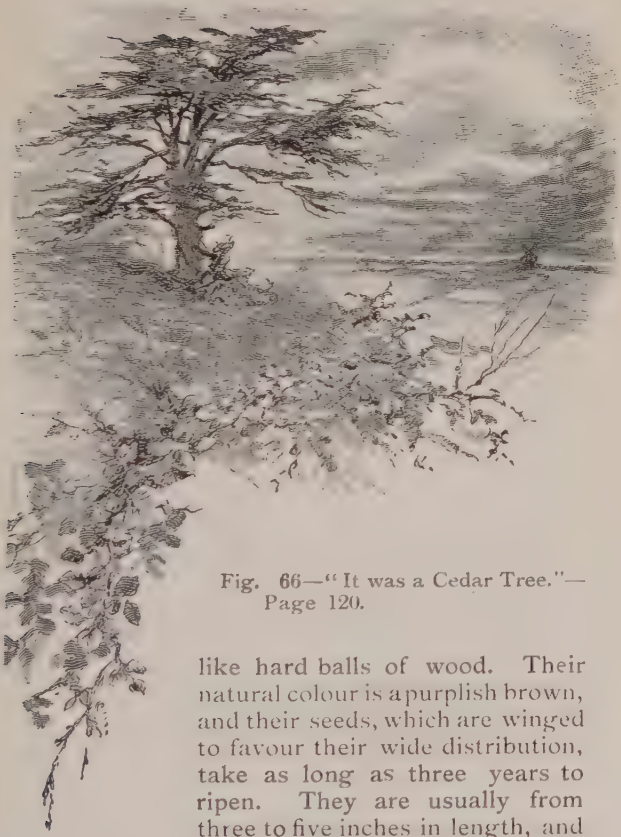


Fig. 66—"It was a Cedar Tree."—Page 120.

like hard balls of wood. Their natural colour is a purplish brown, and their seeds, which are winged to favour their wide distribution, take as long as three years to ripen. They are usually from three to five inches in length, and

Fig. 67--Leaf Spray of Cedar of Lebanon. (*Cedrus libani*).

from two to two and a-half inches broad. They are very resinous, and the resin is often found exuding from the cone scales.

Fig. 68—Bole of Cedar of Lebanon.
(*Cedrus libani*).

Cedrus libani is a slow-growing Tree, but lives to a great age, and it is quite possible, from evidence that has been furnished from time to time, that Cedars now growing on Mount Lebanon are contemporaries of those living in King Solomon's time. There are three very interesting explanations of the origin of the word Cedar.

Fig. 69—Cones of Cedar of Lebanon (*Cedrus libani*).

One is that it comes from an Arabic word *keäroum* or *kèdre*, which means "power"—a most apt designation; another historically and scripturally interesting is that it took its name from the Brook of Cedron, on whose banks this Tree grew; whilst a third explanation is that it is from *kaiō*, a word which means to burn,

Fig. 70—Cedar of Lebanon (*Cedrus libani.*)

because of the use of Cedar wood for burning as incense.

A multiplicity of articles are manufactured by the cabinet-maker from Cedar wood, including lead pencil envelopes, desks, and boxes of all sorts and shapes ; its recommendation being –in addition to its durability and handsome appearance—its fragrant smell. Perhaps the most fitting termination to our chapter on this magnificent Tree will be a quotation from the striking reference to it in the Book of Ezekiel :—" Behold the Assyrian was a Cedar in Lebanon with a shadowing shroud of a high stature : and his top was among thick boughs. The waters made him great : the deep set him up on high with her rivers running round about his plants and sent out her little rivers unto all the Trees of the field ; therefore his height was exalted above all the Trees of the field, and his boughs were multiplied ; and his branches became long because of the multitude of the waters when he shot forth. All the fowls of heaven made their nests in his boughs, and under his branches did all the beasts of the field bring forth their young, and under his shadow dwelt all great nations."

17.

CHERRY.

(Prunus cerasus.)

A PLEASANT vista, that opens out extensively, is suggested by the word cherry, for the name of the garden and orchard fruits bearing this designation is legion—"cultivation" having by the divers arts of the horticulturist, produced an immense variety of "sorts." The one, however, which we discuss in this chapter, is the wild cherry of the woods—beautiful in leaf, blossom and fruit, but bitter to the taste. We prefer the botanical arrangement which classes it in the genus *Prunus*, because—though so different in flavour from the plums—it looks like a plum in miniature. The specific name of *cerasus* is generally admitted to be derived from an ancient town (of the same name) of Pontus in Asia, from which the tree was introduced into Europe. The introducer was Lucullus, a Roman General, and the date of introduction was 68 B.C., and the trees a few years afterwards reached our Islands

Like the plums, cherry blossoms appear before the leaves, another proof of relationship to the

Prunus family. The calyx or outside, usually green, cup of each blossom is five lobed, and the corolla, or inner portion of the flower, consists of five petals, which are white but sometimes tinged with light pink. There are two wild kinds, one with red and the other with black fruit, and they are usually ranked as two species.

The leaves of the Wild Cherry are very beautiful, oval in shape, sharply serrated and sharp pointed. Light hairy down is scattered chiefly on their undersides. Near the apex of the leaf-stalk are two small, reddish-coloured protuberances, or fleshy glands. The venation is very elaborate and beautifully symmetrical, as the illustration given, engraved from a nature print taken by the author, will show. The fruit is very juicy though acid and bitter, and the "stone" enclosing the seed in each berry or drupe, as it is botanically called—a drupe meaning a one-celled seed, with external "flesh" and "bony" or hard within—is larger in proportion to the fleshy part in the case of the Wild Cherry as compared with the cultivated one. Birds have an especial predilection for the berries, sour and bitter though they are. The tree is of rapid growth, and the wood produced is tinged with red, a circumstance that gives it an additional value for the manufacture of articles from it. Its maximum size is usually attained in about 50 years, and it grows about 18 inches a year during the first 10 years. Its timber is close-grained and very firm and strong. It is easily worked and is susceptible of a fine polish.

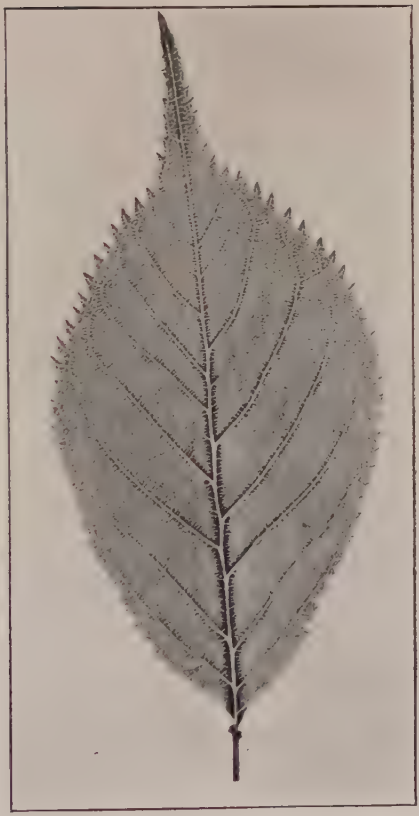


Fig. 71—Leaf of the Cherry (*Prunus cerasus*).

Musical instrument makers use it in place of mahogany, and steeping in lime water for some hours is found to increase its resemblance to this well-known and much-manufactured wood. It is

Fig. 72—Leaf Spray of the Cherry.
(*Prunus cerasus*).

alleged that this plan secures the permanence of its colour, which might otherwise fade under exposure to sunlight. When used for wine casks, as it is on the Continent of Europe, it is

said to improve the flavour of the wine. The rougher parts of the timber are used for vine and hop poles and as hoops for casks. It burns rapidly and therefore makes good fuel. Various liquids are also manufactured from cherry juice: one very favourite drink being "cherry brandy," made by soaking the fruit in spirit, although the spirit so called is very largely what is known as German or potato spirit, a much cheaper and stronger article than brandy. For the very best and choicest kind of cherry brandy, the well-known wine spirit is of course used, but it is consequently more expensive. "Preserves" of fruit are very largely made of cherries, the flavouring juice of which, or cherry essence, being also added to marmalades, lozenges, and other kinds of confectionery. "Cherry drops" are extremely well-known to children. The famous German "kirschewassar" as well as a species of wine and also vinegar are made from cherries, also a liqueur called "ratafia" is manipulated from cherry juice; and to continue - but not to exhaustively complete—the uses of this fruit, it may be mentioned that oil drawn from its kernels is "mixed in" to give flavour to confectioned "creams," "sugar plums" and for emulsions.

18

CHESTNUT.

(*Castanea sativa*).

MUCH more than can be given in our brief *epitome* may be said of the interesting and beautiful Tree which forms our present subject. Those who may seek to study the particular species we are noticing in its many beautiful forms in the wonderful gardens at Kew, will there find it labelled *Castanea sativa*, a designation which is one of its synonyms. If the winter season be the period timed for a visit to those gardens, the first thing that will attract attention will be the beautiful boles, of which we give an illustration. The rugged grooves or channels of bark, running in an oblique direction, are especially noticeable, giving a picturesqueness of appearance that forms a very distinctive character, especially in the trunks of large trees. The knobs shown in our engraving simply indicate the marks or scars, as they may be called, made by departed limbs. The same feature is noticeable in many large trees of other species. As age creeps on a Tree the first-formed and therefore the oldest branches

not infrequently fall off after they have attained appreciable size; although in many instances,

Fig. 73—Naked Spray of the Chestnut.

more especially in the case of the Oak, these earlier limbs, grown themselves to Tree size,

remain. In the case of the Oak the fact attests the extraordinary strength, solidity and endur-

Fig. 74—Leaf Spray of the Chestnut (*Castanea sativa*).

ance of the timber. In the Chestnut there is also a rugged picturesqueness in the entire Tree

when looked at in its winter form, denuded of its leaves.

Fig. 75 – Bole of the Chestnut (*Castanea sativa*).

Chestnut wood, at one time believed to be of the quality and durability of oak, is now deter-

mined to be a much inferior timber. The mistake arose by timber found in old buildings in an excellent state of preservation—in the roof of Westminster Hall, for instance being supposed to be chestnut wood. It has since, however, been discovered that the timber in question is that of the Durmast Oak (*Quercus sessiliflora*), with which we shall deal in a subsequent chapter, under "Oak."

The male flowers of the Chestnut—of which there is only really one European species—although there are several varieties of that—are borne in long catkins, in spiked clusters which are easily recognised, as they hang down plentifully from the twigs which bear them and are nearly as long as the leaves. The fruit-producing or female flowers are much smaller, and after fertilisation by the pollen of the catkins, develop into little prickly balls that enclose the beautiful dark-brown glossy nuts, heaped up in the Autumn on every fruitstall. How many pleasant recollections linger around this edible fruit when piled in plates at Christmas and other gatherings! Familiar, too, it is to every child, as seen on the costermongers' barrows carrying roasting stoves. Its use in "stuffings" is also well known. Abroad the Chestnuts are largely used for food by the peasants, who often suffer when there is a scarcity of supply. Perhaps the largest Trees of this species in the world are the famous Chestnuts of Mount Etna—Trees which have grown to a great age—an especially celebrated one—now if it still exists, hollowed and decayed,

having the enormous growth of 204 feet and big enough to accommodate in its broken interior a

Fig. 76—Winter Form of the Chestnut (*Castanea sativa*).

flock of sheep, and to allow two carriages to drive abreast through it.

As to Chestnut wood it is a curious fact that, unlike the timber of some other Trees, it is more durable when cut in its young state than when older. It is used for a great variety of purposes—for bedsteads—where iron has not superseded wood—for chairs, stools, tables, tubs and wine casks.

The leaves and spray are very beautiful, the central prominent midrib of each leaf showing up with its ramification of veins very distinctly, especially on the undersides of the glossy foliage. We give an illustration of a spray of leaves taken by photography, and reproduced in facsimile. The sharp, spiny serratures on the leaf margins give a very bold and elegantly characteristic appearance that cannot fail to make chestnut leaves easily recognisable when compared with the leaves of other Trees.

19.

CYPRESS.

(*Cupressus sempervirens*).

INTERESTING but mournful associations cling around the Cypress, because of its long connection with the final resting-place of mankind. Its neat shape and evergreen character well adapt it for employment in graveyards, but it is largely used for lawns and parks, giving to them, however, rather an old-fashioned appearance. It was a great Tree amongst the Romans, and it recommended itself by the durability of its timber. Pliny stated that the statue of Jupiter in the Capitol, was made of Cypress-wood, and it had then existed for 600 years, without exhibiting any sign of decay. The doors of the Temple of Diana, also formed of Cypress-wood, had, when 400 years old, the appearance of new timber, a striking proof of its excellence for the purpose it served. The art of lopping—rightly termed "disagreeable" by Gilpin—practised by the Romans, as it is still, in a few instances, in this country—an art consisting of clipping a Tree so as to resemble some bird or beast—was considerably exercised upon the Cypress, living walls being

formed to bound gardens very much in the way that box is used in the present day to form "edgings." One reason for this use may, perhaps, be found in the ancient belief that the odour of Cypress foliage was good for the lungs.

There are several explanations of the origin of the common and botanical names of this Tree. The common name was most likely derived from the Island of Cyprus where the Tree grew in abundance: and the generic name of *Cupressus* is believed to be derived from two words *kuo*, "to produce," and *parisos*, "nearly resembling," in allusion to the uniformity of disposition of the foliage. Loudon gives a curiously exact definition of the form of the Tree by describing it as flame-shaped; for it certainly does resemble a great dart of flame shooting up from a conflagration. Pyramidal would, perhaps, be a better designation; for a very similarly-shaped Tree, the Lombardy Poplar, is distinguished from other and more spreading Poplars by being styled *pyramidalis*.

The Cypress attains a height in this country, of about 50 or 60 feet, though it occasionally exceeds 60 feet. Its branches are very closely covered by sharp-pointed, overlapping leaves that remain on, in their green condition, for five or six years. The male flowers are borne in catkins, as also are the female flowers, but the latter are fewer in number and of a rounded oblong form. The Tree belongs, like the firs and pines, to the order of coniferous or cone-bearing plants, and the Cypress cones, about an inch to an inch-and-a-

Fig. 77—Leaf Spray of the Cypress (*Cupressus lawsoniana*).

half in diameter, are produced in pairs, and each consists of angular, corky scales on the outside

of the nut, which includes five small and oblong-shaped seeds.

As already indicated, Cypress wood is very durable, although it does not grow, ordinarily, to such a size as to produce an appreciable amount of timber. What is obtained is put to a number of minor uses. It is more as ornamental Trees that the various species of *Cupressus* are utilized in this country. Where its evergreen character, its neatness, slowness of growth, and generally "staid" qualifications are appreciated, it will be found convenient to plant it. It looks most imposing in rows and not in masses. The spray we give as an illustration was photographed from the species known as *Lawsoniana*, a variety which is usually considered prettier than the normal *Sempervirens*.

But, in connection with the subject of this chapter, one cannot very well get away from its funereal associations, which are aptly represented in Sir Walter Scott's lines in *Rokeby*:—

"Oh lady! twine no wreath for me,
Or twine it of the Cypress tree,
Too lively g'ow the lilies' light,
The varnish'd holly's all too bright;
The Mayflower and the Eglantine
May shade a brow less sad than mine;
But, lady, weave no wreath for me,
Or weave it of the Cypress tree."

20.

DOGWOOD.

(*Cornus sanguinea*).

FAMILIAR by its striking appearance during the autumn to many a wanderer by country hedgesides, it is probable that a good proportion of those who notice the Dogwood would be unable to name it. The striking feature referred to is the blood-red colour the foliage

Fig. 78 LEAF OF THE DOGWOOD (*Cornus sanguinea*).

assumes when under the full influence which autumnal suns exert on the normal verdancy of summer leaves. When, as is not unfrequently the case, whole hedgesides consist of this interesting plant, the deep, pervading hue is especially prominent. Hence its specific and appropriate

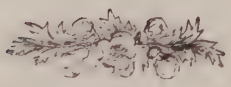
name of *Sanguinea*, a term that explains itself as a synonym of blood-red. The generic name of *Cornus*, from the latin *cornu* "a horn," has reference to the hard, or horny, nature of the wood which is used—as will be presently explained—for purposes requiring toughness.

The Dogwood—whose common name arose from the supposition that its fruit was "not fit for a dog," on which supposition was also founded its further common name of "Dogberry Tree" and "Hound Tree"—is mostly seen as a wayside shrub, although it sometimes reaches Tree size, growing to a height of fifteen feet. Its young shoots are also red, its flowers—borne on cymes or umbels, terms both meaning that several stems and flowers are given off from the end of a common general stem—are a creamy white, each having four petals. Its berries are dark purple or black, and bitter to the taste. The leaves are very characteristically veined, as our illustration will show, and egg shaped but acutely pointed. Their hue is a dark green, and the surface on both sides is very smooth. A curious and distinguishing feature of the leaves is the strength and tenacity of the spiral vessels which run through them. When the leaf, or leaf stem, is snapped, and the superposed tissue is drawn asunder, the spiral vessels, like threads, will hold the severed pieces together. It must, of course, be a gentle pull or the whole would snap.

Few old hedges are without the Dogwood, which has a very wide distribution in this country, and is also common on the continent of Europe.

It prefers a chalk or limestone soil, where it is usually found in especial abundance, and is commonly in flower in the month of June, its fruit being produced about August or September; whilst, from September to October, its favourite hedgebanks are dyed with its splendid autumnal hues.

At one time its hard wood was used for mill cogs, as also for arrows—in the days when the bow was employed as a weapon of defence- and it is now very commonly utilized for ramrods, skewers, toothpicks, &c., and larger pieces—cleared of their pith—were used for tubes. As it burns readily, it makes good fuel—and excellent charcoal, for gunpowder, can also be manufactured from it. Toys are sometimes made from the wood, and oil, for certain purposes, such as soap-making and even for burning, is extracted from the berries.



21.

ELDER.

(Sambucus nigra).

ALTHOUGH modest in size, not often reaching a height of more than 30 feet, the Elder possesses a considerable number of "virtues," if we use this word in the sense of utility. It is one of the best known of our Trees, and there can be little doubt that it is an indigenous one; but it is not easy to trace the origin of the common name. *Sambucus*, however, is derived from a latin word *sambuca*, meaning a musical instrument: because at a very early date Elder branches, from which the proportionately large pith had been withdrawn, served for making flutes and other musical "pipes." The specific name of *nigra* had allusion to the dark colour of its foliage. The leaves, like those of the Acacia and Ash, are pinnate—two or more opposite pairs of leaflets—with one terminal one comprising the leaf. Each leaflet is oblong in shape, and pointed at the apex, and is usually smooth and dark-green in colour, and sharply serrated on the edges—wavy veinlets proceeding to the leaf margins from the rachis, or midrib. The Tree

being fond of moist positions, and being a rapid grower, the leaves vary in size according to more or less favourable conditions; and these conditions

Fig. 79—Leaf of the Elder (*Sambucus nigra*).

affect the size, development and divisions, of the foliage—the normal five leaflets becoming seven in the larger leaves. This is a peculiarity,

common to many pinnate leaves. It is largely a question of vigour—the midstem giving rise to extra pairs of leaflets under more favourable conditions of growth than where the Tree is stunted through the influence of uncongenial soil and a dry position.

The white flowers are borne on cymes; but the cymes are usually five-branched, and present a very conspicuous show of bloom, the cream colour of which contrasts strongly with the dark verdancy of the foliage. There is a faint, somewhat sickly, perfume in Elder flowers, and when these pass into the stage of fruit there is usually a considerable display. The best known use of the small, round-shaped, purplish-black Elderberries is for the manufacture of what is now regarded as an old-fashioned beverage, "Elderberry wine": generally spiced and drunk hot. Port wine is sometimes adulterated with the fermented juice of the same berries.

Quite an interesting catalogue could be made of the uses of the various parts of the Elder Tree and its products. A decoction of the berries is said to be good for catarrhs and sore throats; fomentations for acute inflammation can be made of the flowers, and a fragrant "tea" can be obtained also from them. After infusion, the flower "water" is used to give flavour to some confections, and is said to be cooling when sponged upon the skin. A dye can also be made of the berries.

Elder wood is very soft when young, but, as it acquires age, it becomes hard, and being yellow

in colour, can be manufactured into various articles, such as skewers, pegs used for boots in

Fig. 83.—Leaf Spray and Blossom of the Elder (*Sambucus nigra*).

lieu of nails, props for vines, and other trailing and climbing plants: and even the pith is used in electrical experiments.

Some curious superstitions cling to the Elder Tree. It was believed by the ancients to be emblematical of death, and that those who slept beneath its branches were likely to die ; or that doing so would cause a stupor that might bring on death. Indeed, it has been averred that this was the Tree on which Judas hanged himself. There is, however, another species, that may be said to compete for this honour, and which bears the common name of Judas Tree.

Slips from the Elder will easily take root ; so readily, in fact, that it is easy to make a small plantation of them ; but good soil is necessary, with plenty of light and air and abundant moisture.

22.

ELM.

(Ulmus campestris.)

NEXT to the sturdy Oak no other of our Trees can be said to out-rival the stately Elm. For vigour, stability, beauty and utility it stands far ahead of most of the inhabitants of the park and forest. It seems, however, to prefer the vicinity of man, and is a familiar object in almost every wayside hedge, but, as generally seen when bordering cultivated fields, it is found to be stripped of much of its beauty by the practice of the husbandman in lopping off its lower branches to prevent their overshadowing and injuring crops. When, however, it is seen by itself growing apart from other Trees, and in its natural, unpruned state, it is an object of great beauty, which is especially striking in its wintry form, as shown in our illustration. To arrive at full perfection requires quite a century and a half, and then it has acquired a powerful grip on the soil, and its contorted roots, often showing above the surface, present a most picturesque appearance. Its branches and twigs are also twisted and

Fig. 81—Naked Spray of the Elm.

contorted in a very striking manner; in this feature it very much resembles the Oak, for which it may be sometimes mistaken until identified by

Fig. 82—Leaf Spray of the Common Elm (*Ulmus campestris*).

its very different foliage. The bole—which often makes a splendid picture—has a good deal of resemblance to that of the Oak in the ruggedness

of its fissured bark. A curious habit which makes the Elm dangerous to those sitting or standing under it is a tendency to drop huge limbs, that are subject to an insidious decay of which there are no exterior signs.

Our present subject is the small-leaved Elm, the most abundant in this country of the several species. The word Elm and the generic name *Ulmus* are derived from the Saxon word *elm* or *ulm*, and a similar name runs through all the Celtic dialects. The German city of Ulm derives its name also from the abundance there of Trees of this genus; and in this country the Tree has given its name to rather a considerable number of places. Even in the Doomsday Book no less than forty places were enumerated that derived their names from the Elm.

One peculiarity distinguishing the small-leaved Elm from the other species we notice. *Ulmus montana* is the habit of the roots in throwing out suckers which extend for some distance along the surface, and throw up shoots that can be detached to form separate plants.

The leaves of *Ulmus campestris*, the specific name meaning "of the country"—and this is especially appropriate because, with us, it is the most familiar of all our country Trees—are placed in alternation on the stem—not in pairs. They are somewhat pear-shaped, serrated on the edge, and pointed at the apex, each having a very short stem, and they are veined in a very beautiful manner—the veins proceeding with great regularity from the rachis, or midvein, in

Fig. 83—Bole of the Common Elm
(Ulmus campestris).

a waved diagonal direction to the leaf margin. Their substance has rather a crinkled appearance, and at the base of the leaf is a little notch on one side that gives it an easily distinguishable character. The spray of leaves shown in our illustration will clearly exhibit all the points we have mentioned, and this shows the network of smaller veinlets that run between the lines of the principal ones, reticulating—or crossing as in network—in a very pretty manner. The flowers are borne in inconspicuous little branches, that emerge from the scaly buds, which have protected them from wintry cold, and are purplish-red in colour. They expand before the leaves and disclose a calyx comprising four stamens which bear the fructifying pollen, and when they have performed their purpose of fertilising the ovaries, the fruit appears in the form of thin, wing-shaped receptacles, each enclosing one seed, the form of the envelopes assisting, later on, their dispersion by the wind. But it generally happens that, in this country, the small-leaved Elm does not ripen its seed, and therefore the common mode of multiplication is by cuttings and suckers.

The colour of Elm wood is brownish; it is fine-grained and hard, and is put to a considerable number of uses; in boat-building, for tool handles, wheelbarrows, for water shoots, pumps, piles, troughs, and for any purpose where the wood required to be emp'oyed is exposed to the weather. Coffins are also made of it, and doors of all kinds. The cabinet-maker, too, uses Elm boards to a considerable extent.

Fig. 84—Winter Form of the Common Elm *(Ulmus campestris)*.

The Wych Elm, or Scotch Elm, as it is frequently called—*Ulmus montana*, is readily

Fig. 85—Leaf Spray of the Wych Elm (*Ulmus montana*).

distinguished at first sight from *Ulmus campestris* by the larger size and more handsome appearance of its leaves. These are not only larger, but are

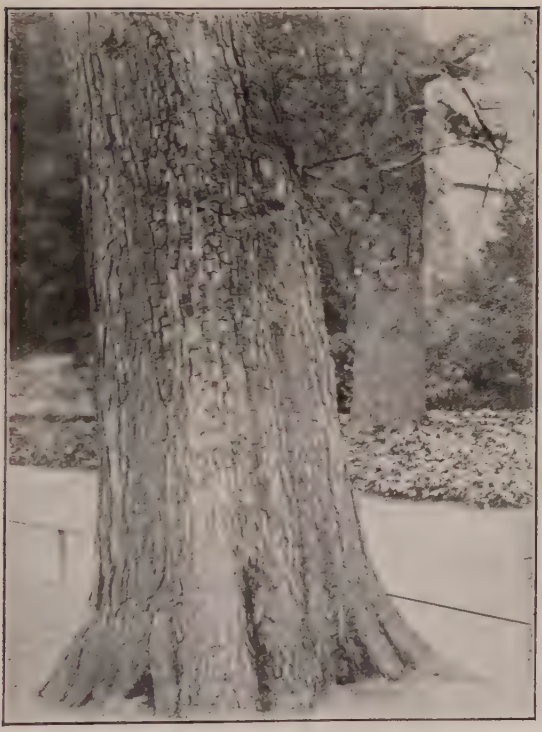


Fig. 86 Bole of the Wych Elm (*Ulmus montana*).

less "crinkled" than those of the small-leaved Elm, and our illustration of Spray will exhibit the difference. Their surface, like that of their con-

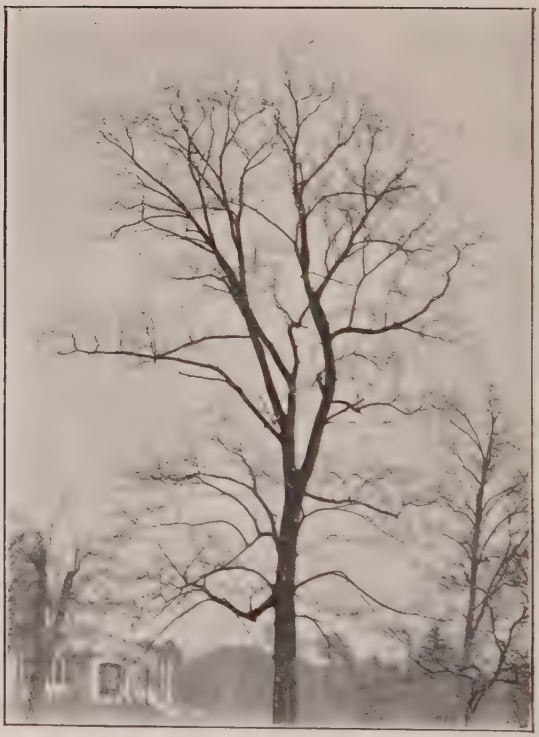


Fig. 87—Winter Form of the Wych Elm (*Ulmus montana*).

geners, is rough, but there is noticeably a greater elegance in their contour. The flowers are similar, but rather larger and paler. *Ulmus*

Fig. 88—Bole of the Cork-Barked Elm (*Ulmus campestris, variety suberosa foliis variegatis*).

montana does not throw up suckers from its roots as the Common Elm does, but, in compensation for this, it grows more readily from cuttings or layers. A layer means a twig of the Tree that is bent down and fastened to the ground until it has taken root, when it is detached from the parent Tree. Also, unlike *Ulmus campestris*, it produces a great abundance of seeds, and ripens them generally during the month of June. It can also be more readily grafted. The mature Tree is usually less upright than the Common Elm, and is more spreading in its habit, and the branches sometimes droop. There is, in fact, one "weeping" variety—*Ulmus montana pendula*—which has a very graceful appearance. Being a more rapid grower, the timber of *Montana* is less valuable than that of *Campestris*—it is less hard but somewhat liable to split. As its alternative common name implies, the Wych Elm is a native of Scotland. It will grow on dry rocky soil, but greatly prefers a deep, rich soil of loam.

23.

FIR.

(*Abies excelsa*).

THERE is a great confusion in the popular mind, and not much less confusion amongst botanists, past and present, with regard to the points which should distinguish those cone-bearing Trees, whose common names are Cedar, Fir, Larch, and Pine. The puzzle in the popular mind is chiefly concerned with what constitutes the difference between a Fir and a Pine. Our one indigenous or native Tree, which, to be in accordance with a consensus of botanical opinion, we will name *Pinus sylvestris*, is alternately called the Scotch Fir and the Scotch Pine: and its timber is sometimes called fir-wood and sometimes pine-wood; but the best plan is to take refuge from the distinctions by calling it *deal*. Reference to a dictionary will only tell us that deal is the wood of the fir or of the pine. For instance, we refer to that monumental work in eight large volumes—"The Century Dictionary." On turning to "Fir" we find this description: "Any Tree of the genus *Pinus*." Under "Pine" we have the

following statement :— "A coniferous Tree, properly of the genus *Abies*, in distinction from the Spruce (*Picea*), a term also applied" (here the writer clearly has *Abies* in his mind and *not Picea*, his last word used) "more loosely to Trees of other genera, as *Picea* and *Pinus*."

In our alphabetical arrangement of Trees in this volume, we have preferred to give the most generally-accepted popular names for easy reference; indicating against each the most generally-applied botanical name; and, in selecting the botanical name, we have mostly followed the common-sense plan of that excellent compiler Loudon. We will, therefore, in the present place quote Loudon's explanation of his reasons for his grouping of the conifers, of which we shall give descriptions; premising that we shall only have space, in this small pocket-book, to give a few specimen Trees out of a very long list because an exhaustive treatment of the cone-bearing Trees would alone require a much bigger volume than this one can be.

Now for Loudon's definitions taking them in the order already mentioned. Under *Cedrus* (Cedar) he says (rather vaguely) "Majestic evergreen Trees; natives of Asia and Africa, with large spreading branches. Extremely ornamental and one species producing excellent timber." Under *Abies* (Fir) his description is: "Evergreen Trees; natives of Europe, Asia and America. Remarkable for their tall, erect, pyramidal forms, and profusion of foliage. One or more species are useful, and the rest ornamen-

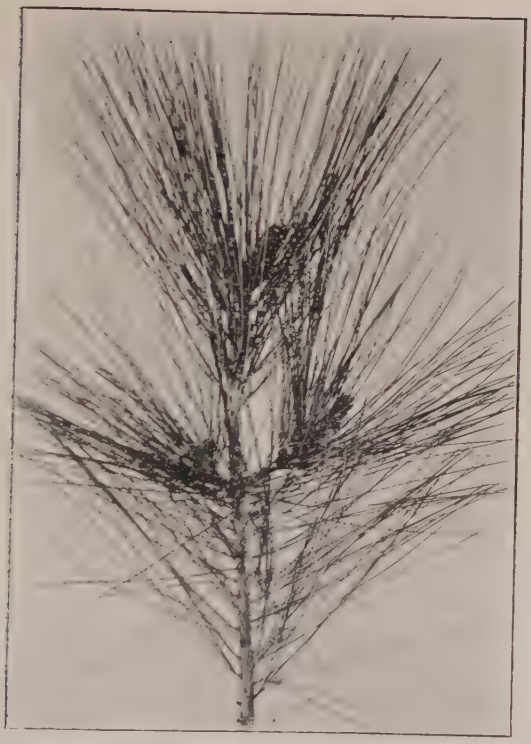


Fig. 89—Leaf Spray of the Spruce Fir (*Abies excelsa*).

tal. In Britain, they flower in May and June, and ripen their cones in the spring of the following

year. All the species bear seed at a comparatively early age ; and all of them may be readily propagated by cuttings taken off in the spring, according to Dumont de Courset ; or, in autumn, according to the practice of British gardeners. All the species hitherto introduced are quite hardy in British Gardens. The genus, taking it altogether, is so truly national, that, without any great violence, all the different kinds of which it is composed, might be reduced to three or four species" (an opinion with which we heartily concur). Continuing, under Fir, comes *Picea*, and here our author says :—" Trees remarkable for the regularity and symmetry of their pyramidal heads ; readily distinguished from the genus *Abies* by their leaves being more decidedly in two rows ; by their cones being upright, and having the scales deciduous ; and by the seeds being irregular in form. The nucleus of the seed is exposed at the inner angle, through a considerable opening in the outer *testa*," (*testa* from the latin "a pot," means a seed shell) "as if the junction of the two sides had been ruptured by the rapid enlargement of the nucleus. They are natives of Europe, Asia and America ; but, generally, in regions more temperate than those in which the species of spruce abound. In Britain, with the exception of *Picea pectinata*, they are solely to be considered as ornamental trees."

Loudon's description under *Larix* (Larch) is :— "Deciduous Trees" (an important point of distinction being the falling off of the leaves in winter) "some of them of large dimensions ;

natives of the mountainous regions of Europe, the west of Asia, and of North America; highly valued for the great durability of their timber. In Britain, all the species are ornamental; but the first (*Laria europæa*) is the only one deserving of culture as a timber Tree." And finally, under *Pinus*, Loudon says: "Evergreen Trees, generally of large size, natives of Europe, Asia and America, and in an eminent degree, both useful and ornamental. They flower, in Britain, in May and June, and generally ripen their cones in the autumn of the following year."

We think that the order *coniferæ*, or cone-bearing Trees, might, with great advantage be less split up into genera than they are by botanists—who unfortunately will not agree, and differ, appreciably as Doctors do—but, accepting the position, it may be useful to the reader as an external mark of distinction to quote a comprehensive note by Loudon, in which he remarks upon the general form of the Trees "The genera of *Abies*, *Picea* and *Larix* form conical trees of the utmost regularity of figure, in every stage of their growth; the different species of *Pinus* and *Cedrus* on the other hand, form regular cones when they are young and until they attain a certain age; but their heads become round or flattened as they grow old; the branches near the bottom of the trunk drop off, and those near the summit increase in thickness, and in lateral extension; and hence the grandeur of the heads of these trees, when favourably situated and of great age. The genus *Cedrus* is remarkable for the

horizontal direction taken by its branches in every stage of its growth."

Our digression will not, we trust, have been without interest to the general reader; but turning now to the first of the two subjects of this chapter we shall find that *Abies excelsa* justifies its botanical name in its common one, which is "the Lofty or Norway Spruce Fir." It, in fact, takes precedence, in height, of all other European Trees, rising frequently to 150 feet and sometimes reaching 180 feet. It is remarkable for a very upright trunk, and has a bole sometimes 6 feet in diameter. Its branches extend widely, spreading out on each side with great regularity. In old trees they droop gracefully and often touch the ground. We give an illustration of the leaf spray. The male flowers are borne in catkins, which are numerous; their colour being yellowish, tipped with red, and their size, being only half-an-inch to an inch in length, give them somewhat the appearance of unripe strawberries. The female flowers, also borne on catkins, are produced at the extremities of the branches, and, when they have been touched by the yellow pollen scattered upon them by the male flowers, soon develop into the cone of which we give an engraving. The length of the cones varies from five to seven inches, and their breadth from an inch-and-a-half to two inches. Two seeds are enclosed in each scale of a cone, and they are rough to the touch, small in size, and reddish brown in colour. The scales of the cones, from base to apex, observe a spiral or

zigzag direction, and are so numerous that one cone may contain between 300 and 400 seeds. Sometimes, when the branches of a large Spruce

Fig. 90—Cone of Spruce Fir (*Abies excelsa*).

Fir touch the ground, they take root and produce a number of separate Trees, forming a circle around the parent Tree to which they thus give a patriarchal character.

The natural positions of the Spruce, as of all other Firs, are in mountain ridges, to which they lend a majestic appearance. Their shallow-rooting tendency enables them to occupy such positions when the surface soil is often of little depth. Its timber is of an excellent quality, but light and elastic, and varying considerably according to the nature of the soil. It is reddish in colour or yellowish white, and contains an abundance of resin, one of the products of which is what is known as "Burgundy Pitch." The fine-grained wood takes a good polish and is manufactured into a variety of articles such as the linings of furniture, the frames of musical instruments, packing boxes, etc. It is also largely employed for the flooring and roofing of buildings; and for oars, spars and topmasts of vessels, scaffold poles, ladders, etc.; whilst the bark is used for tanning, and the buds and leaves for the manufacture of the well-known "Spruce beer."

The Silver Fir (*Picea pectinata*), like *Abies excelsa*, is the finest of all the species included in its genus, rising often-times like the last described—to a height of 180 feet: and, it too, possesses a very erect stem and handsome spreading branches, but it produces a larger trunk, extending to 8 feet in diameter. Its common name it derives from the silvery appearance of its leaves, especially noticeable on their undersides, and along the course of the midribs. The

bark is also whitish grey, which accentuates the general silvery appearance. The Tree has a hand-

Fig. 91—Leaf Spray of the Silver Fir (*Picea pectinata*).

some pyramidal appearance, and is very much of the general form of the Norway Spruce. *Picea* is the

latin for "pitch pine," and *pix*, from which probably has been derived *pectinata*, means pitch, the allusion being to the quantity of that commodity produced by the Tree. The leaves are in two rows and turned up at the points, and the silvery hues are, as stated, chiefly on the undersides, where the leaves are also concave. The male flowers are produced on catkins, which are usually rather less than an inch long. The cones are cylindrical in shape and are in marked contrast to the round, ball-shaped cedar cones: but seed-bearing cones are rarely produced until the Tree is about forty years old—infantile cones sometimes appearing earlier. It is a species that grows rather slowly until it is ten years old; after which its advance is more rapid.

Like that of the spruce, the wood of the Silver Fir is elastic, but its colour is white. It has an irregular grain, and is used for very much the same purposes as the timber of the first-named Tree. For planks of floors, joists, rafters and partitions, for boat building, for the masts of vessels its straight erect shape lending itself, especially for this purpose and in short, for the miscellaneous purposes to which the ordinary carpenter and cabinet-maker put "deal," the generic term applied so extensively to the wood of the various conifers.

24.

GORSE.

(Ulex europæus).

SO much does the golden glory of the blossoming Gorse add to the beauty of forest glades and wayside hedges and to moors that would otherwise be bare, that a brief notice must be given of this most interesting plant. Although in this country it is seldom seen larger than shrub size—growing to a height of not more than twelve feet—on the continent of Europe it grows eighteen feet high with a stout trunk, entitling it to rank as a Tree. It has a very excellent way of making itself known by the sharpness of its prickles and the almost impregnable fence it forms in places where it is allowed to grow in abundance. It belongs to the order called *Leguminaceæ* already referred to, as comprehending plants whose fruit is contained in *legumes* or pods, and it is thoroughly and undoubtedly British. Its bright yellow flowers are produced in great abundance, and are succeeded by plentiful pods and seeds. It flowers during a considerable portion of the year, and this circumstance has led to the old saying that "love goes

Fig. 92—Leaf Spray of the Gorse (*Ulex europæus*).

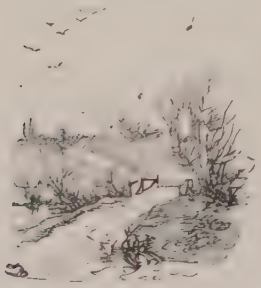
out of fashion when the Furze is out of blossom," for Furze, as also Whin, are alternative common names for this plant. The derivation of the

name Furze does not seem to be known ; but it has been suggested that Gorse may have come from a native word *grost*, meaning growth or undergrowth. This, however, is only a supposition.

Its utility is of a general, though subordinate, character. It serves for hedges, where stout fencing is required ; makes excellent fodder for cattle, and, if used green and bruised, is found very nutritive ; the "live" plants make a good shelter for nursery growths ; it also, in a dry state, furnishes excellent fuel ; and a yellow dye used to be manufactured from the blossoms and employed for staining "Easter Eggs."

The pretty lines of Hurdis may, in conclusion, be quoted :—

"And what more noble than the vernal Furze,
With golden baskets hung ? Approach it not,
For every blossom has a troop of swords
Drawn to defend it."



25.

GUELDER ROSE.

(Viburnum opulus).

A PRETTY and conspicuous adornment of many wayside hedges is the Guelder Rose, and although not usually, in the wild state, exceeding a height of 12 feet, it attains, under cultivation, an appreciably larger size, entitling it to be considered a Tree. This fact proves, what we have previously stated in this volume, that favouring conditions of growth will often cause a shrub to extend from shrub to Tree size. A certain, but slight, similarity, in its foliage and spreading cymes of blossoms to the Elder will perhaps explain that Guelder is a corruption of Elder, and that the word Rose is added on account of some likeness to the wild rose. Alternative common names are Marsh Elder, Rose Elder (which would so easily merge into (Gu'elder Rose) and Water Elder. Loudon, however, says that the plant takes its name from Gelderland which might originally have been Elderland in the Low Countries. The generic *Viburnum* is a derivation from a latin word, meaning a wayfaring Tree another species of the same genus, and *opulus*

is supposed to be a corruption of *populus*, the generic name of the Poplars—and given to the

Fig. 93—Leaf of the Guelder Rose (*Viburnum opulus*).

present subject on account of a certain resemblance of its leaves to some of those of the Poplars.

The leaf is beautifully veined, principal veins proceeding from the apex of the leaf-stem through

Fig. 94—Leaf Spray of the Guelder Rose (*Viburnum opulus*).

the centre of the lobes into which it is elegantly divided; and, from each of these, veinlets continue to the indented margin. The spray, of which we

give an illustration, shows a graceful disposition, around the twig, of the long-stemmed leaves. Just before the winter, the foliage assumes a beautiful hue, sometimes of pink and sometimes of crimson. The flowers are white, the cymes having long, principal stems: and the succeeding berries are elliptical in shape, bright red in colour, juicy but bitter, and even nauseous to the taste. They make a conspicuous and splendid show on the Tree. Spirit has been distilled from the berries, and the young shoots are sometimes used for the tubes of tobacco pipes.

26.

HAWTHORN.

(Cratægus oxyacantha.)

PICTURESQUE ruggedness of stem, elegance of leaf and beauty and fragrance of blossom, combine to give interest to the familiar and popular Hawthorn, whose most generally used common name it is also called "White Thorn,"

Fig. 95—Leaf of the Hawthorn (*Cratægus oxyacantha*).

"Maybush," "Quick," "Quickset" and "May"—is derived from *hage* or *hag*, a hedge. Another character of the plant is indicated by the generic name of *Cratægus*, which comes from the word *kratos*, meaning strength; for its stout and

twisted stems, in an especial degree, are strong.

There are a number of species of the same genus, but the one now under notice is the

Fig. 96.—Naked Spray of the Hawthorn.

Common Hawthorn, so abundant in every woodland and hedge in this country. It makes a very

respectable Tree, although ordinarily seen as a small spreading hedge shrub, and it easily attains a height of twenty or thirty feet, and may rise as high, in its unrestrained woodland habitats, as fifty feet, some very fine specimens of it being found in our Hampshire New Forest. A girth of nine feet or three feet thick, is by no means uncommon. The sharp spines with which its branches are liberally furnished, make it of especial value, when planted thickly as a cattle fence, and indeed the vast majority of fencing hedges are made of "Quickset." It is found to be what is called "patient" of the shears: so that when hedges are trimmed, they become greatly thickened by the "driving in" of its vigorous and sturdy shoots. Even when the leaves have fallen in the autumn and the dense shelter is reduced, the prickly branches still form an almost impregnable hedge, which tears the clothes of the intruder and offers a rampart against cattle of all kinds. The leaves are extremely elegant, varying much in form on the same Tree. They are hard in texture, thin, glossy, especially on the upper sides, and are cleft into three, four or five bluntish lobes usually trifid or three cleft the lobes in turn being more or less indented. In the trifid form the upper lobe is more deeply indented than the lower ones.

The venation is regular and beautiful, principal veins running to the apices of the lobes and to the dividing crenations, and originating a system of reticulation which largely fills the whole leafy surface. Dark green, except in early spring, is

their prevailing hue, but the undersides are paler. The leaf-stems are usually long and slender. The flowers are five-petalled and are borne on corymbs —a corymb being a kind of inflorescence in which the parts of it originate at different points of the main flower-stem, the lower flowers having longer stems than the upper ones, so that the corollas are brought nearly to a level, and give the appearance of a flat head of blossom. Although ordinarily white or cream-coloured, a pink or almost scarlet hue is not infrequent ; and, as is well known, the cultivated garden variety is frequently a brilliant scarlet. The delicious perfume of the Wild Hawthorn makes the air redolent of it for some distance around the places where it grows, and it lends a delightful "influence" to May hedges.

Very familiar to all who visit the country are the bright red "haws" or berries. Borne, like the flowers which they succeed, in corymbose fashion, they add very much to the brilliance of autumn hedges. Occasionally the berries are yellow and sometimes black, but the prevailing colour is red. They are greatly appreciated by birds, and not infrequently are eaten by children.

The Tree is a rapid grower and will occasionally make twelve feet in the first four years, but it advances much more slowly afterwards, and thus succeeds in producing very hard white wood, the colour, however, frequently being yellowish. It has a fine grain and readily polishes, and can be used for a variety of purposes. A very large number of stout walking sticks are made from it,

also tool handles and mallets, and numerous small articles to which it is restricted by its usually small size. As fuel it is found to give out great

Fig. 97—Bole of the Cockspur Thorn (*Cratægus crus-galli*).

heat, and furnishes a ready supply of "faggots" for country use.

THE COCKSPUR THORN—*Cratægus crus-galli* is an extremely picturesque relation of the Common Hawthorn; but it is a native of North America, and in this country is only

Fig. 98—WINTER FORM OF THE COCKSPUR THORN (*Cratægus crus-galli.*)

to be seen in parks and plantations. Some most interesting specimens can be seen at Kew Gardens, and of one of these we give engravings, showing the winter form of the Tree and the

curiously-contorted bole. There is a twisted character throughout the Tree very characteristic of the various species of the genus *Cratægus*, but the one we figure is probably more picturesque than any of them. The Cockspur Thorn flowers about the same time as *Cratægus oxyacantha*, and its fruit, also scarlet berries, ripens about the same time. It has been a good many years in this country, having been introduced in the year 1691; and probably on account of its striking features, it has been cultivated more than any other American species.

In the warmer parts of England it is almost evergreen, retaining its leaves and berries oftentimes right through the winter. All the Trees of the genus have very much the same character of hardness and durability, and their wood can be put to similar uses. Moreover, they grow to a considerable age. Their general forms, whether in summer or winter, their beautiful leaves and flowers, delightfully fragrant when not cultivated into what is called double blossoms, and their handsome and brilliant berries, render them excellent Trees for ornamentation, and their modest dimensions make them adaptable for small lawns or gardens. Bird lovers who wish to encourage their favourites would do well to plant as many of these "Thorns" as possible, because of the great fondness of many of our feathered friends for the "haws."

27.

HAZEL.

(Corylus avellana).

FEW of our Trees gather around them more subjects of interest than the Hazel, so familiar as a shrub in all our hedges—"low down" and high up—growing in the North of England, to a height of 1,600 feet above sea

Fig. 99—Leaf of the Hazel *(Corylus avellana).*

level, and attaining Tree height of 30 feet, with a 3 feet diameter of bole, under favouring conditions. Its fruit, in the form of the hedge-nut, finds its way into all our markets, and immense quantities are brought to us from abroad.

But for a very long time past, and notably of late, the extraordinary power, supposed to be possessed by its twigs, when held in the hand, of indicating things hidden in the earth, such as secret water springs and metals, has given it a peculiar reputation.

We give illustrations of both an individual leaf and of a spray of leaves: and it will be noticed that it a good deal resembles the Alder leaf, already dealt with, the form and general appearance and size being very similar, as is also the veining and the serratures or indentations along the edges; but it differs from the leaf of the Alder by having a pointed apex instead of a distinct depression at the top of it. There is also, just below the base, which is slightly indented or depressed—another mark of distinction—a little abortive leaf called a *stipule*. Botanically a stipule is described as a "foliacious appendage." There is a hairiness or woolliness on the undersides of Hazel leaves, and extending along the veins. The flowers are borne in cylindrical catkins, and are very conspicuous in their golden-green hue, because they appear before the leaves, as early as February. The tiny female, or nut-producing organs, are inconspicuous at first, but as soon as they have been fertilized by the influence of the pollen of the male flowers, they appear in the angles of the twigs, looking like scarlet buds. These soon "show up" when the nut is formed, and the latter is then seen to be encircled by a green calyx or cup, with jagged edges—the husk—as it might be termed—that is

Fig. 100—Naked Spray of the Hazel.

torn off before the nut is cracked, if picked from the Tree, although, in commerce, these are got rid off before the fruit comes to market, except in

the case of filberts a cultivated form of the Hazel nut—which are usually sold with the *calices* —plural of calyx —on. The nut is a pretty object of study, looking something like a miniature globe, except that it is oval and not round, the streaked, or striped shell, being marked in three ways, with dividing lines like belts.

Squirrels, and some birds such as the nuthatch and the woodpecker—feed delightedly on this hedge fruit. The wood is never of sufficient size to be made much of in manufacture, except for numerous small purposes. It is much used for fishing rods,—for which its pliability and elasticity fit it —and walking sticks: but it also serves for crates, ties for fagots, hoops for casks, hurdles, and stakes, and the "live" plants make a fairly good fence. The colour of the wood is whitish red, and it has a close even grain, but is not considered to polish well. Large roots, however, are sometimes curiously veined, and have been used for veneering cabinets. The pliable branches serve well also for making rustic seats, and to compensate for the stripped branches not taking a good polish for walking sticks, the latter are made, very often, with the bark on, and that gives them a very natural appearance. Oil can be extracted from the nuts, and Evelyn said that hazel nuts were fattening, and remarked: "When full ripe, the filberts especially, if peeled in warm water, as they blanch almonds, make a pudding, very little, if at all, inferior to what our ladies make of almonds." In our own day, this opinion is confirmed, and it is generally believed, that

these nuts are very nutricious. Squirrels, birds, and even insects are of presumably the same

Fig. 101—Leaf Spray of the Hazel
(Corylus avellana).

opinion, for, as tiny holes in the shells will indicate, it is not birds and squirrels alone that feed on the tasty kernels.

The plant has given its name to a number of places, such as Hazelmere, Hazelbury, Hazlingfield, and is also adopted for giving designations, —such as Hazeldene, &c.—to villa residences and small country properties. In reference to its alleged divination qualifications, it will be interesting—in view of what has recently been published on the subject to quote what Evelyn said: – "Lastly, for riding switches and divinatory rods, for the detecting and finding out of minerals, (at least, if that tradition be no imposture,) it is very wonderful, by whatever occult virtue, the forked stick (so cut and skilfully held,) becomes impregnated with those invisible steams and exhalations, as by its spontaneous bending from a horizontal posture, to discover not only mines and subterraneous treasure, and springs of water, but criminals guilty of murder, &c.; made out so solemnly, and the effects thereof, by the attestation of magistrates, and divers other learned and credible persons, (who have critically examined matters of fact,) is certainly next to a miracle, and requires a strong faith. Let the curious, therefore consult the philosophical treatise of Dr. Vallemont, (*Physique occult ou Traité de la Bague divinatoire*) which will at once entertain them with a world of surprising things." No doubt the belief in the divining rod is much anterior to the time of the famous author of *Sylva*. It goes back to the time of the Romans, and about the fifteenth and sixteenth centuries, the art of divining in conjunction with the rod, was called "Rhabdomancy."

We may dismiss the belief that criminals could be so discovered, as pure superstition; but the allegation of certain persons, in our own days, that they have the "gift" of being able, hazel rod in hand, to find water, has been so repeatedly brought forward, accompanied by a certain amount of evidence, that one is inclined to put a certain amount of trust in it, as an indication of a mystery of nature. Various theories have been propounded to explain it, but the subject still remains wrapped in a considerable amount of doubt. The present writer believes, firmly, that established instances of dreams coming true, and similar things connected with the apparently supernatural, are explainable as mere coincidences: and the same consideration might explain "water finding." It is well known that the "water finder" is not always successful; but so much is made of his success, that there is a natural disposition to lose sight of his not infrequent non-success.

We must not forget to add, in conclusion, that the word Hazel is derived from the Anglo-Saxon word *hæsil*, signifying a head-dress, and doubtless, referring to the green cup that encompasses the nut; whilst the specific name *avellana*, is originated from Avelline, a town of Italy, where it grew in great abundance; and *corylus* from the Greek *karuon*, a nut.

28.

HOLLY.

(Ilex aquifolium.)

"IS there, under Heaven, a more glorious and refreshing object of the kind, than an impregnable hedge of one hundred and sixty feet in length, seven feet high, and five feet in diameter, which I can show in my poor garden at any time of the year, glittering with its arm'd and varnish'd leaves? The taller *standards* at orderly distances blushing with their natural Coral: It mocks at the rudest assaults of the *Weather*, *Beasts*, or Hedge-breakers."

Thus, in a burst of enthusiasm, wrote Evelyn in his *Sylva* (we have copied his exclamation *verbatim*); and a very beautiful Tree it undoubtedly is, at all stages of its growth, from the small and ornamental shrub, dotted here and there in lawns, to the forestal Tree of a yard thick. The common name is usually understood to be a corruption of the word Holy, suggested by its association with the Holy Week at Christmas, for decorative purposes, etc. *Ilex*, its generic name, was bestowed upon it because of the resemblance to the Evergreen Oak (*Quercus ilex*); and *aquifolium*

is believed to be compounded of two words, *acutum*, sharp, and *folium*, a leaf; but we think

Fig. 102.—Leaf Spray of Holly (*Ilex aquifolium*).

a much preferable explanation is that it comes from two words, *aqua*, water and *folium*, a leaf, in

reference to the shining and watery appearance of the leaves. It has been known to attain a height of 60 feet.

Holly leaves are very beautiful, and are well worth minute examination, although the venation cannot be so very readily traced over the dark green and rather thick leafy cuticle. We give an illustration of a spray of leaves, as well as one of the unpruned Tree. The foliage varies considerably, being much more smooth in some instances than in others, whilst, under cultivation, an appreciable number of departures from the normal form may be found, the variation chiefly consisting of mottlings of white and yellow, which contrast strikingly with different hues of green. The flowers, generally appearing in May, are white, the corolla of each consisting of four or five petals. They are produced in the axils or "little armpits" of the leaves, and the bright scarlet berries, so well known, and so readily recognised, succeed the blossoms in the same position.

The wood of the Holly is very white, but sometimes of a brown tint in the centre of old trunks; and being fine-grained and hard, and readily taking a fine polish, it is used, as much as the limited supply of it will admit of, for many purposes of the joiner and cabinet-maker. It is heavy, and can be easily stained different colours, and when dyed black, it is—owing to its weight—employed to imitate ebony for handles of metal teapots, &c. its non-conducting qualities preventing the heat from the metal from being communicated to the hand.

Fig. 103 - HOLLY—*(Ilex aquifolium).*

The Holly thrives best in sandy loam, well mixed with leaf mould, to impart richness to it. It can be grown from cuttings and from seed, which, however, take two years to germinate : but it is not a

very rapid grower. This, perhaps, is the reason why it is not more frequently used for hedges, although it makes, unquestionably, the best of all "live" fences. One great advantage it has over other "live" fence shrubs, such as Hawthorn, is that it readily grows under the shelter and drip of other plants. A rather curious fact in connection with *Ilex aquifolium* as a fence, is that in the lower parts of it, where its prickles are needed to resist encroachments, it develops a more bristly character, whilst higher up the foliage becomes smoother. This circumstance doubtless prompted the following lines of Southey :—

"Oh reader! hast thou ever stood to see
The Holly Tree?
The eye that contemplates it well perceives
Its glossy leaves;
Order'd by an Intelligence so wise,
As might confuse an atheist's sophistries.

"Below a circling fence its leaves are seen
Wrinkled and keen;
No grazing cattle through their prickly round
Can reach to wound;
But, as they grow where nothing is to fear,
Smooth and unarm'd the pointless leaves appear."

29.

HONEYSUCKLE.

(Lonicera periclymenum).

ESPECIALLY reminiscent of country hedges and woodland glades, is the sweet-scented Honeysuckle, whose common name is well deserved—as honey, although not the product of the bee, does lurk at the bottom of its tubular

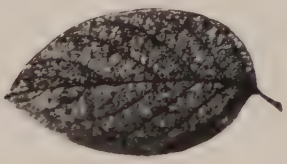


Fig 104—Leaf of the Honeysuckle (*Lonicera periclymenum*).

corolla, and the custom of children to pluck off the blossoms from their stems, to get at and suck the sweet fluid, gave rise to the designation. The botanical generic name is after Adam Lonicer, a German Botanist, and the specific *periclymenum*

is compounded of two words, meaning "to roll round about," in reference to its twining habit. The alternative common name of woodbine is

Fig. 105—Leaf Spray of the Honeysuckle (*Lonicera periclymenum*).

more descriptive of its character than Honeysuckle, as it climbs up into hedges -matting the other

vegetation—and twists itself around the limbs of trees with considerable force, growing to a length of sometimes over 20 feet, although seldom producing a trunk or stem of any appreciable proportions.

Shakespeare says :—

> "So doth the woodbine, the sweet Honeysuckle
> Gently entwist the Maple."

But Cowper especially indicates the tightening of its tendrils around forest Trees in the lines :—

> "As woodbine weds the plant within her reach,
> Rough elm, or smooth-grained ash, or glossy beech,
> In spiral rings ascends the trunk, and lays
> Her golden tassels on the leafy sprays ;
> But does a mischief while she lends a grace,
> Straitening its growth by such a strict embrace."

A curious feature of the twining of the Honeysuckle is, that it turns from east to west. The leaves are oval in shape, slightly pointed at the base, and at the apex, and are produced in opposite pairs along the stem. They are concave on the undersides, and prettily shaped along the edges, whilst the veinlets are beautifully reticulated on each side of the midvein. The cream-coloured flowers are funnel-shaped, that is, wider at the tops than below. They are borne in little clusters, or heads of blossoms, that terminate a long general stem ; and the succeeding bunches of berries are nearly round, and deep red in colour.

30.

HORNBEAM.

(Carpinus betulus).

HORNY-TEXTURED wood has caused the name of Hornbeam to be given to this very beautifully-leaved Tree; and probably the most likely derivation of the generic name of *Carpinus*, is that it comes from *Carpentum*, meaning a chariot, as the Romans were in the habit -doubtless because of the qualifying hardness of the wood—of making chariots from it. The specific *betulus* is from the generic name of the Birch, and this Tree the Hornbeam is sometimes called the Birch Hornbeam.

The major portion of the Trees in Epping Forest are Hornbeams, but they have, in general, a very stunted appearance, consequent on the practice -now extinguished of top-lopping the Trees for winter fuel—a practice said to have been originated by a special permission given by Queen Elizabeth, to the poor people, living in and around that forest. The practice of top-lopping was performed in exercise of a curious and interesting stipulation made by the maiden Queen, and it had a great deal to do with the

maintenance of commoners' rights, which secured the preservation down to our own times, of a

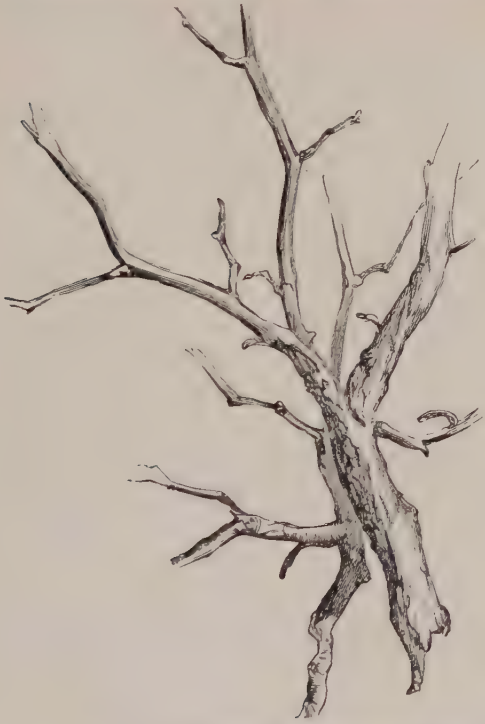


Fig. 106—Naked Spray of the Hornbeam.

considerable tract of forest, that would otherwise have been "filched" by encroachments. When

Fig. 107.—Leaf Spray of the Hornbeam (*Carpinus betulus*).

that beautiful public domain was preserved for all time for public enjoyment, the practice of top-

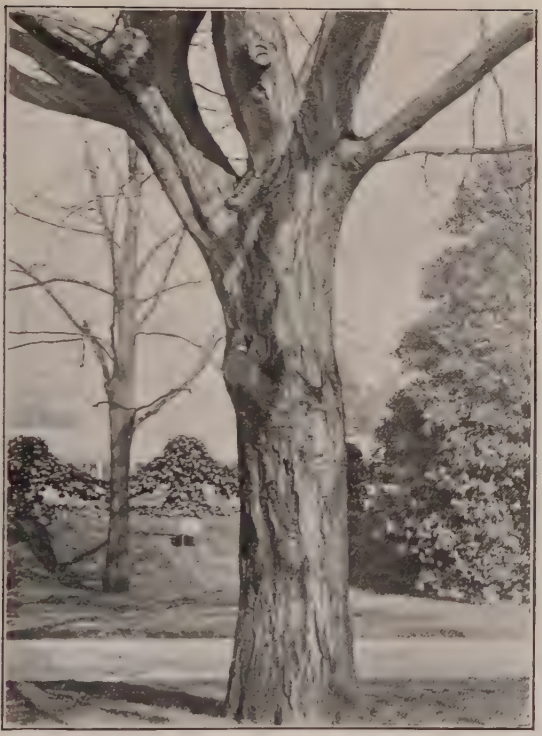


Fig. 108—Bole of the Hornbeam
(Carpinus betulus).

lopping had, under compensation to the commoners, to be discontinued, as it was spoiling the appearance of the Trees.

Fig. 109—Winter Form of the Hornbeam (*Carpinus betulus*).

But the Hornbeam, when unpollarded, is a very handsome Tree, attaining a height, under favouring circumstances, of 60 to 70 feet. The leaf-spray we give will be the best description of the

strikingly-beautiful foliage. It is dark green in colour, and beautifully veined. The flowers are produced in yellowish catkins, and are succeeded by small, angled, seeds (about the size of barley grains) which are ripe in the autumn.

Hornbeam wood is very hard and heavy, white in colour and close-grained. It does not polish well, and is inclined to shrink in the process of drying, and thus it loses a good deal of its green weight. Being rather difficult wood for a carpenter to treat, lessens the number of uses to which it is put. But it is employed by wheelwrights for the yokes of cattle, for mill cogs, and for some other rural purposes. It makes admirable fuel, and from it can be made the best kind of charcoal. A yellow dye can be extracted from its inner bark, and on the continent, its leaves are used for cattle fodder.

As it thrives in almost any soil, it makes a good and neat hedge or fence. Rapin, in a poem in latin, entitled "*The Gardens*," wrote the effusion, of which the following is a translation :—

"Let beauteous hornbeams one fair part adorn ;
Another cypresses, with judgment shorn ;
These mazy windings form a wilderness,
Which hornbeam hedges in true nature's dress,
Along the alley sides their boughs expand :
Like verdant walls the firm, espaliers stand ;
And while the eyes their various forms delight,
To private walks and shady bowers invite."

31.

HORSE-CHESTNUT.

(Æsculus hippocastanum).

AS beautiful to the eye as it is deceptive to the taste, is the fruit of this handsome tree: and one explanation of its common name is that the nuts, so much like those of the edible chestnut, are only fit for horses to eat; but to the horse, and to other animals, the nuts of *Æsculus hippocastanum* are medicine, but are not selected as food. The generic name *Æsculus*, is derived from the latin word *Esca*, which means food, victuals, whether of men or horses; and *hippocastanum* comes from *hippos*, a horse, and *castanea*, a chestnut. But there is, perhaps, a more interesting explanation of the common name. On the undersides of the twigs, where they join main branches, there is a curious mark looking just like the print of the nails in a horse-shoe.

The large leaves—divided into five or seven leaflets—arranged in a circle or whorl—a whorl being a sort of ring round a central axis—are extremely striking and handsome. Each leaflet is very much like a chestnut leaf, and that furnishes another reason for its name. The structure of the leaf

makes an interesting study: bold veinlets going off on each side from the prominent midvein, in nearly parallel lines, to the serrated margins.

Fig. 110—Leaf of the Horse-Chestnut (*Æsculus hippocastanum*).

Between these veinlets there is a delicate reticulation of still smaller veinlets. The blossoms are borne in big clusters, whitish in colour, but under variation, in cultivation, are often red. They

are very conspicuous in May, the flowering time, covering the Trees so densely, as almost to obliterate the leaves. Probably the finest display of their floral splendour, is that which can be witnessed in the magnificent Horse-Chestnut avenue in Bushey Park, Middlesex, in the drive leading down to the well-known Hampton Court Palace.

Nature has no more wonderful and beautiful arrangement than that comprehended in the winter buds of the Horse-Chestnut. The conical forms of these buds, covered by a shiny, gummy exudation, that protects them from cold and frost, are very noticeable on the twigs: and many years ago, a famous German naturalist, had the curiosity to open and magnify the contents of one no bigger than a pea. Within that tiny space he discovered a marvellous and almost incomprehensible microcosm of future parts of the plant. The minute outside receptacle, of the size mentioned, the slimy, gummy-looking bud, consisted of no less than seventeen protective scales or sheaths, wrapped one upon the other, and all cemented together by the gum. Underneath this elaborate system of envelopes were the microscopic forms nursed under soft downy covering of four leaves.

Reader, it is worth reflecting, at this point, in our bud-narrative, that the word "downy," simple as it is, comprehends a mass of hair or down, each a minute organism, separately working under the omnipresent power of the Divine Giver of all good things. In the centre of these

four tiny leaves, was the incipient flower-spike of the forthcoming season! Bringing a great power of magnification to bear upon these tiny bud

Fig. 111 NAKED SPRAY OF THE HORSE-CHESTNUT.

contents, it was discovered that 68 flowers could be counted, and that even the very pollen on the stamens of these could be seen!

And now for a brief "vignette," ere we leave

this part of our subject, from the paragraph, recording in "*Our Woodland Trees*," this one of nature's stories "without an end":—"With the gentle warmth of spring, the bud cement begins to melt and yield. There is an unwrapping of the scales. The dark, outer coverings fall back. The rising sap, pressing from below, exerts its influence to swell the enfolded life. Then the inner coats of purest down appear, and are in turn thrown off, and rapidly the imprisoned leaves and flowers come forth to light and air—the leaves with tint of golden green; the flowers with hues of white, and pink and gold. The great-leaves, at first, hang flaccidly upon the twigs, as if drooping for want of moisture. But they soon expand, stiffen, and spread out their large surfaces from the summit of their long, green and stout stalks."

Being a very rapid grower, readily and quickly springing up from the roots, if these are promptly planted, the Horse-Chestnut produces wood that is too soft for any very valuable uses. It is employed for a variety of minor purposes, such as for packing cases, linings for carts, and occasionally in "cheap buildings," for floors. On the continent of Europe, it is manufactured into sabots, and it can be employed for water shoots, and for pipes, when the latter are kept constantly under ground. In some places it was the custom to administer the ground nuts as medicine for horses suffering from broken wind; but whether it is favoured in our days for this purpose by veterinary surgeons, is more than we should like to aver. Deer, goats and sheep will feed on the fallen nuts,

Fig. 112—Leaf Spray of Horse-Chestnut (*Æsculus hippocastanum*).

and it has been stated that the flesh of pigs, sheep and poultry is improved when these creatures are

Fig. 113—Bole of the Horse-Chestnut (*Æsculus hippocastanum*).

fed upon them. Paste is said to be improved in strength by an admixture of the "flour" of the nuts. The bark has found employment also as a medicine, as well as for tanning, and for the production of a

Fig. 114—Winter Form of the Horse-Chestnut (*Æsculus hippocastanum*).

yellow dye: and to add finally, to this respectably-long list of uses, it may be stated that a jelly, formed from the nuts, has been made into soap, and that ashes from any part of the Tree furnish potash.

32.

ILEX.

(*Quercus ilex.*)

ALTHOUGH the subject of this chapter is an Evergreen Oak, we introduce it here under its more general common name of Ilex, although sometimes it is called the Holm-Oak, on account of the likeness of its leaves to those of the Holly, which used to be called the Holm. A "holm" is also the designation of a small islet whose surface rises, rounded, above the sea, and the rounded head of an Ilex seen, standing alone, at a little distance, suggests a by no means entirely fanciful resemblance to such an islet for this Tree never grows very high, although it produces a bole which, as our engraving will show, is often of very respectable dimensions. Moreover, the Ilex appears to like the neighbourhood of the sea, and often grows on the elevated portions of holms, although we are not aware that the suggestion we make as to one possible origin of the name has ever been made before.

The leaves- sharply serrated on their edges, and sometimes sharply spined are dark green,

except when young, when their spring growth shows up vividly against the sombre ground of

Fig. 115—Leaf Spray of the Ilex (*Quercus ilex*).

the old foliage, which is very persistent. Our illustrations of spray will indicate their oval form,

and show that the leaves are concave on their under-sides. As the foliage is never off the Tree, whilst living, it is impossible to exhibit the bare wintry form, but it nevertheless differs materially from that of its deciduous congeners. The flowers, both male and female, are borne on small catkins, and are succeeded by dark brown acorns. These, when they have germinated, grow rather rapidly at first, but much more slowly afterwards. It is a curious fact that, like the Holly, the lower leaves are more spined and prickly low down in the Tree, but smoother higher up. The Tree takes two years to perfect its acorns, for which reason the fructification is described as being biennial. Another curious feature is that some acorns on the same Tree are sweet, and some are bitter.

It has been averred that the Oak referred to in the Holy Scriptures was probably the Ilex. In any case, there is plenty of evidence that these Trees were very well known to the ancients. Pliny, the historian, refers to them, and mentions some that were 1,400 or 1,500 years old. He even alleged that one Tree growing in the Vatican was older than Rome itself, and that it had, fixed upon it, brazen letters, in Etruscan characters. Virgil and Horace also refer to the Ilex, and it seems established that it was regarded by the Romans as a sacred Tree.

For purposes of ornamentation, the Ilex is very suitable, as also for living fences. It grows rather rapidly for the first few years, and its evergreen character, and the circumstance that it

Fig. 116—Bole of the Ilex (*Quercus ilex*).

has the capacity of withstanding both sea-air—which materially and injuriously affects some of our Trees—and the smoke of cities, renders it peculiarly suitable for city parks and gardens,

and for sea-side esplanades. It is a deep-rooter, and prefers a chalky, or sandy, rather than a loamy soil, and a position not too high above sea level. It does not take kindly to trans-

Fig. 117—Ilex (*Quercus ilex*).

plantation, another peculiarity which likens it to the Holly ; but when it is raised from acorns planted in pots, and shifted from pot to pot as it grows, without disturbance of the roots, it

will suffer no drawback when planted out in open ground.

Ilex wood has many of the qualities of other species of its genus. It is brown in colour when mature, close-grained, hard and heavy, and very durable and flexible. It is employed by the shipwright for various purposes; makes excellent handles for tools, is available and suitable for axletrees, "beetles," chairs, mallet-heads, wooden pins, wedges and palisades. It is also useful, and is largely employed, for the woodwork required in fortifications. In fact, it serves for almost as many purposes requiring excellence as the universal oak timber of the universal Tree.

33.

IVY.

(Hedera helix).

NOT one of our Trees is more popular, or has furnished the poet at all times with more interesting lines, than the fascinating subject of the present chapter. Mant, one of the most exquisite of descriptive versifiers, painted its character in the following lines :

> "Its verdure trails the Ivy shoot
> Along the ground from root to root ;
> Or climbing high, with random maze,
> O'er Elm and Ash and Alder strays ;
> And round each trunk a network weaves
> Fantastic, and each bough with leaves
> Of countless shapes entwines and studs
> With pale green blooms and half-formed buds."

And the same writer says :—

> "The Ivy, fairest plant to seize,
> And promptest on the neighbouring Trees,
> O'er bole and branch, with leaves that shine,
> All glossy bright, tenacious twine
> And the else-naked woodland scene,
> Clothes with a raiment fresh and green."

Mere prose seems inadequate for description of this delightful plant, and one seems impelled to linger on with the poets when thinking of it.

Mrs. Hemans, another charming writer, bursts into enthusiasm when the Ivy comes into her thoughts ; and she sings :—

"Oh! how could fancy crown with thee
In ancient days the god of wine,
And bid thee at the banquet be
Companion of the Vine?
Thy home, wild plant, is where each sound
Of revelry hath long been o'er ;
Where song's full notes once peal'd around,
But now are heard no more."

The following prose note, penned by the present writer, many years ago, will convey an impression that perhaps no re-writing could well intensify. It was in reference to Mant's picturing the Ivy as clothing a "naked woodland scene" with "a raiment fresh and green" ; and he remarked :—"But it is much more than 'fresh and green.' Delightful as is this, its characteristic, it revels in the loveliness of other colours, and none are finer than those seen on the sunny sides of autumn hedgebanks ; for there, when much of the summer vegetation has gone, and fallen leaves give room for the display of the beauty of the glossy trailer, it may be seen in perfection, dark green, light green, bluish green, red, orange, purple and yellow, with shades and markings and blendings of all these which make variety that is very beautiful. As with many leaves, so with the Ivy, the veins give play, so to speak, and variety, to the tinting, for the reason that the tissues of which they are composed and the tissues immediately surrounding and investing them longer retain the normal green colour of the leaf. Very frequently,

after the leafstalk has turned reddish purple, or purple, the principal veins and adjacent tissue remain green, whilst the smaller veins, and the spaces of tissue between them, have turned yellow, or red, or orange or purple. The venation of the Ivy is very elaborate and beautiful. The form of the leaf is marvellously varied, though rarely departing from the three-lobed or five-lobed form, but the rounding or elongation of the lobes is very various in different individuals. A principal vein runs from the apex of the leafstalk through the centre of each lobe, and, from these veins, the forking and branching of the veinlets is very elaborate, resembling, indeed, very much, the contorted and twisted ramifications of the Oak. It is from the upper surface of the Ivy leaves that the most beautiful tints are to be seen, and as it is the upper surfaces which are exposed to the sunshine, the circumstance furnishes another proof that it is to the action of the sunlight upon the chemical substances contained in the superficial plant cells that is due the marvellous hues that contribute to the splendour of autumn."

Although the Ivy is veritably a Tree, often rising to a height of 20 feet, and probably going much higher, when its means of support enable it to do so, it never springs erect from the ground. Sir J. D. Hooker describes it as "a climbing shrub;" Loudon more safely refers to it as "a rooting climber." It is, in fact, both, and as most commonly seen, a shrub only; but it can produce a trunk ten inches in diameter, according to the maximum of Sir J. D. Hooker,

and probably under favouring conditions, it produces a far thicker trunk than that. The

Fig. 118—Leaf of the Ivy (*Hedera helix*)

late Shirley Hibberd, many years ago, devoted a "monograph" to the Ivy, and, unsolicited,

kindly presented a copy to the present writer. Those who are especially interested in this delightful plant should read what is a most elaborate and interesting volume, mainly, however, concerned with garden varieties—whose name is legion—of the Ivy. Referring to height Mr. Hibberd says, probably with truth :—"To what height a thriving plant is capable of ascending no man knows ; for the loftiest sweep of rock, the tallest Tree or tower, will be surmounted by it in time, if no accident occurs to stop its growth midway."

What is called Tree Ivy, is merely the common Ivy, grown large under favouring conditions, and it is curious that when it has grown, as is often noticeable, against the trunk of an elm or oak in a hedge, to about ten feet in height, the upper leaves are altogether different, being less divided into lobes—and many of them unlobed or entire than those lower down. In spite of opposite opinions, it has been pretty clearly established that the climbing roots, or the roots thrown out by the joints of the Ivy as it travels, do extract nourishment from the trunk of the larger Tree against which it trails, and that it is actually parasitic. Shakespeare, therefore, was right in his remark :—

> "He was
> The Ivy, which had hid my princely trunk
> And suck'd my verdure out,"

the proof being that when the Ivy trunk, near the ground, has been severed, the upper portion will continue growing and thriving for years afterwards.

Fig. 119—Clustered Spray of Ivy
(*Hedera helix.*)

The greenish or yellowish-white flowers of the Ivy, odoriferous and honey-stocked, and consequently sought after by insects, are produced in umbels little, stemmed bunches growing from the end of a long general stem and the round berries, black, and sometimes, but rarely, yellow, follow in similar clusters.

Of the uses of *Hedera helix*, which is a native of Britain, and constitutes the normal form from which such a host of varieties have sprung, a good catalogue can be made. The wood being soft and porous, and usually deficient in quantity, is not ordinarily employed in manufacture, except by the turner, but thin slices are useful for filtering liquids. Cato and Pliny alleged that if wine suspected of being adulterated with water be put into a cup made of Ivy wood, the wine will find its way through the wood leaving the water in the cup. This is an experiment which it would be very interesting to see tried; although it has also been alleged that what is more probable happens, and that the water goes through the wood, leaving the wine in the cup. On the principle, in nature, of what is called *exosmosis*, liquids can pass outwards from the insides to the outsides of wood structures, through the cellular tissue. It is this capacity which explains the exudation of saps in the form of sugary matter, gum, etc., from Trees. Similarly by *endosmosis*, they can pass from outside, inwards, and this also explains why plants can get the benefit of moisture otherwise than through the roots, although the root action

in absorbing moisture from the soil is on the principle of *endosmosis*.

Ivy berries are injurious to human beings, or at least they are purgative and emetic; but they are greedily eaten by birds, and even the leaves, supposed to be poisonous, are eaten by deer and sheep. A black dye can be made from the berries, and the smell of their juice is said to cure a headache; and what is called *hederine*, which is aromatic and resinous, can be extracted from Ivy berries, and is said to serve as an aperient.

As to the derivation of the botanical name—*Hedera* comes from a celtic word meaning a cord; and *helix* from one meaning "to encompass or turn round," in reference to the environing character of the plant; whilst Ivy, the common name comes from a celtic word, meaning green.

34.

JUNIPER.

(Juniperus communis).

FOR the origin of its common and botanical, or latinised name, we can only fall back on a celtic word, the meaning of which is rough or rude, in allusion, probably, to the plant being stiff and rough; but the same character applies to many Shrubs and Trees, which do not, on that account, acquire a name from it. The pertinence, or otherwise, of botanical nomenclature, is a very "uncertain quantity"; but doubtless in the necessity which has existed for finding such a huge number of distinctive appellations, it has not been easy to furnish every individual with an especially appropriate one. With needle-shaped or awl-shaped leaves, like those of the conifers generally, the best explanation of form is shown in the spray engraving we give, reproduced from an actual photograph. The male flowers are borne in small catkins on one set of Trees, and the female ones, produced in the axils of the leaves in another set the pollen of the former being yellow in colour. The resulting fruit is in the form of purplish black berries and not cones;

Fig. 120—Leaf Spray of the Juniper (*Juniperus communis*).

so that there is no justification for including the Juniper amongst coniferous Trees.

It makes a very small evergreen Tree, but sometimes attains a height of 30 feet, and it is averred to be the Tree mentioned in Holy Scripture, under which the prophet Elijah took refuge in the wilderness of Beersheba, to avoid the persecution of King Ahab. Hence it may be assumed that the Tree in question must have been one of considerable size: although, considering its pyramidal shape, the prophet could only have taken shelter behind it, and not under it, as he could have done in the case of a more pendulous Tree. In confirmation of its size, Pliny states that very large Junipers grow in Spain. An ancient practice of throwing Juniper berries on a funeral pile to protect the spirits of the deceased from the influence of evil, and offering them in sacrifice "to the infernal gods" with the same object, under the belief that the perfume from the burning would be grateful to those deities, seems to have come down to our own days, as, on the continent of Europe, the peasantry have the idea that if they burn branches of Juniper outside their doors, evil spirits and witches will be kept at a distance.

Sir Walter Scott alludes to this in the lines we quote from *The Lady of the Lake*:-

> "A heap of wither'd boughs was piled
> Of Juniper and Rowan wild,
> Mingled with shivers from the oak,
> Rent with the lightning's recent stroke."

The Rowan he refers to is the Mountain Ash a pretty red-berry Tree. Birds have a great

fondness for Juniper berries, and it is believed by some persons, that burning the berries provides a disinfectant and a preventive of contagion from infectious diseases. In France, a beer called ginévrette is manufactured from the fruit of *juniperus communis*, and in the flavouring of gineva, "hollands," and "london gin"—all very much the same kind of thing—the berries are extensively used. Oil of Juniper is an unquestioned specific preventive of the painful and incapacitating ailment called lumbago, or muscular rheumatism, the result of a chill in what is called the lumbar region of the body, very well known to those who have suffered from it.

Juniper wood is used for several small purposes, such as for walking sticks, wooden cups and other articles of turnery. It is yellowish-brown in colour, aromatic in smell, and finely veined. It also makes excellent fuel, and is employed, too, in smoking hams. It is a hardy grower, and in deep sandy loam, will thrive well, and will live to the age of a hundred years.

35.

LABURNUM.

(Laburnum vulgare).

WHO does not know this Tree, resplendent when in the full flush of its blossoming-with its pendant racemes, or "golden chains"? An alternative botanical name is *cytisus laburnum*. In Scotland it is called the Pea Tree, from the likeness of its fruit pods to those of the pea. It grows to a height of 20 feet, and sometimes more, its usual height being less than that; and although it cannot be claimed as a native British Tree, it is a welcome and handsome stranger. The leaves are pinnate, and the leaflets in opposite pairs, with one at the end of the mid stem, are of an oval lance-shape, clothed with pubescence, or woolliness, on the undersides, and in spring they are of a bright golden green, and look very delicate and graceful. In the mountain forests of the continent, the Tree grows wild, and adds a gorgeous aspect to its surroundings when it is in the full glory of its bloom. In this country it is only found under cultivation, and is chiefly utilized for ornamentation.

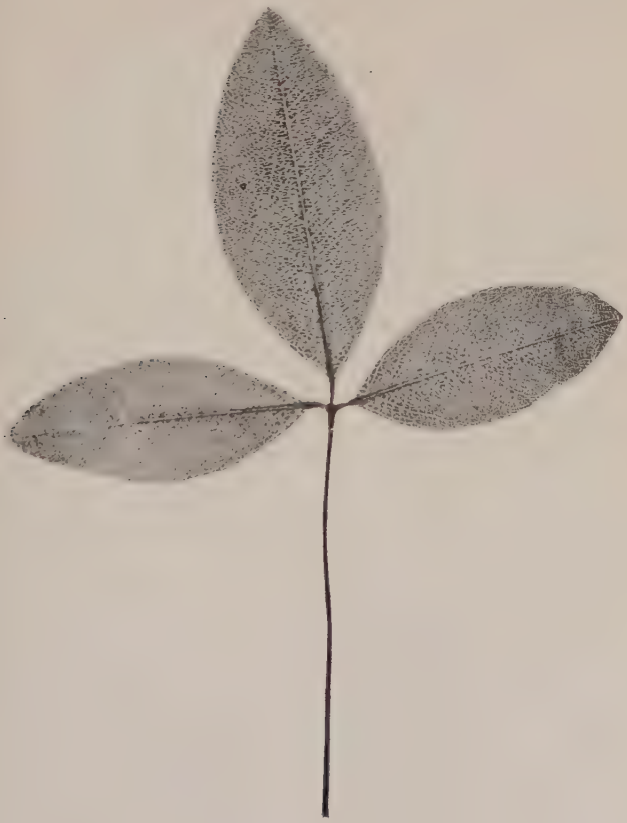


Fig. 121—Leaf of the Laburnum (*Laburnum vulgare*).

Its timber, although coarse-grained, is very durable, the heart-wood being darker than the rest, and, by polishing, it can be made to look like ebony. A variety of the species, called the Alpine Laburnum, is said to have been found wild in Scotland, but the statement seems to have been doubted. In any case, there was, at one time, a considerable demand in Scotland for Laburnum wood, which was used for manufacturing into bowls and noggins (or small casks), knife handles, toys of different kinds, punch ladles, musical instruments, wedges, pulley blocks, small boxes of various kinds, tables, chairs, and other and sundry articles.

33.

LARCH.

(Larix europæa).

SO important from a utilitarian point of view is this deciduous conifer that many volumes have been devoted to its description, history and uses. Here we can only give, in a short chapter, an epitome of what is most interesting in connection with a very valuable Tree. Whether clothed with leaves in its summer dress, as our engraving chances to present it, or with naked branches in winter form because it is the only native conifer whose leaves fall off in the cold season—it is ever a characteristic and striking object, especially when it is seen clothing some steep hillside, or mantling the highest ranges of mountains. Its common and botanical names have the same derivation—from the celtic *lar*, meaning fat, in allusion to the abundant supplies of resin obtained from it. The specific name indicates its European range, although an inferior species is an inhabitant of the North American continent. Our European species, both in size and in the quality of its timber, is superior to any of the others. The leaves are fascicled, that is to say, are

produced in little separate tufts along the branches, and may be likened to little bunches of short grass, each one being what is described as needle-

Fig. 122—Naked Spray of the Larch.

shaped—a character appertaining, with slight variation, to all the conifers. In spring, when the new leaves are appearing on the bare branches,

Fig. 123 -Leaf Spray of the Larch (*Larix europæa*).

their vivid green makes them show up very conspicuously against the dark-brown of the twigs, and, when the foliage is fully out, and before it

has time to turn to the darker hue of summer, it looks very beautiful. The flowering, in normal seasons, takes place in March or April. The male flowers are produced in catkins, slightly oblong in shape, but nearly globular, their colour being a light yellow. The female catkins incline towards a reddish colour, and are followed during April or May, by the cones which appear singly on the branches. They are oblong in shape, and are borne erect on the stems, and are usually about an inch in length, although the size varies, the species under notice having rather larger cones than others of the same genus. The seeds are generally about the eighth of an inch long, and are oval in shape.

The timber of the Larch usually arrives at full maturity in about forty years, but the Tree, when required for certain purposes that will presently be mentioned, is cut down long before it has reached that age. The wood is compact, and has a brownish or reddish tinge. It takes the Scotch Pine double the time mentioned, or, at the earliest, sixty years, to fully mature its timber. One defect in Larch timber is its liability to warp, a tendency which has to be compensated for in certain manufactured articles by cross-piecing. In comparison with others of our Trees, the Larch is not a long liver, but will survive up to two hundred years. In the first fifty of these it will attain a height of eighty feet and sometimes more and will reach a maximum height of a hundred feet or more, when a girth of trunk, at five feet from the ground, of between ten and twelve feet will have been reached.

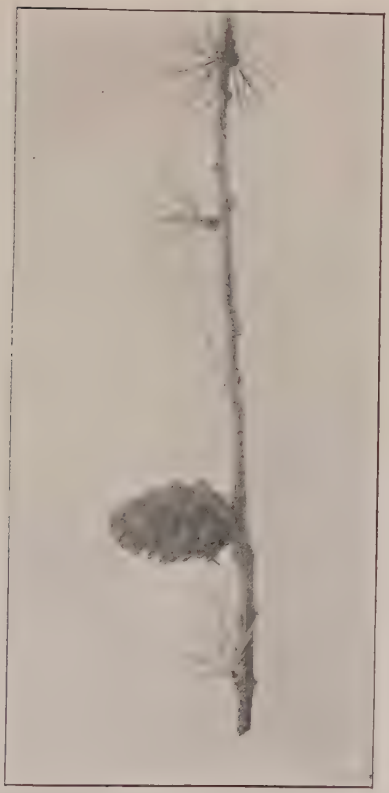


Fig. 124—Cone and Leaves of the Larch (*Larix europæa*).

Loudon, however, alludes to a Tree called the great crooked Larch, that, with a height of only

between forty and fifty feet, had a girth, just above the roots, of nineteen feet, and immediately under the two great limbs into which the Tree had forked and near the ground, its girth was fifteen feet. A picture of this Tree given in Loudon's *Arboretum*, explains why the girth was so exceptional, when compared with height. It was clearly due to the unusual forking, and the same feature may be noticed in other Trees under similar circumstances. Departures from normal forms are quite unexplainable, but where nature has decided, so to speak, upon a departure, she adapts herself to the unusual Tree conditions. The rule, in the case of the Larch, is for the Tree, with the whole strength and resources of the roots, to throw up a stem in one long, straight column. When this column near the ground divides—unaccountably and mysteriously to us—into two columns, the roots would seem to make a special effort to maintain two columns each nearly of average thickness; but the exceptional resources thus brought to bear the extra amount of sap and nutriment have to pass for the first two or three feet from the ground, though one trunk which is required to be the basis of two Trees, so to speak, instead of one. Hence nature's wise provision of basal support.

The bark of the Larch being astringent, especially in young Trees, is used for tanning. The wood, although it warps, can be prepared in a way largely to prevent the warping tendency. It is durable and tougher than imported foreign deal, and it does not crack. It is, therefore,

Fig. 125—Bole of Larch (*Larix europæa*).

useful in boat building, in mill work for which timber is required, and, as a substitute for oak, on railways for sleepers; and for a considerable

number of purposes for which a carpenter uses deal; and the straight character of the young Trees, makes them valuable for hop and other poles and stakes required for plant support. For this especial purpose in the garden, young plantations are made, and the Larch Trees are planted close together, so that they may be drawn up into the necessary narrow and erect forms.

As to the soil best suited for this most valuably-useful Tree, De Candolle, of botanical fame, wrote:—"Amongst all the general circumstances which have an effect on vegetation, that which appears to me most necessary to the prosperity of the Larch, is that it should at the same time have its roots in a soil habitually but moderately damp, and its top exposed to the direct rays of the sun, so that the evaporation of water, and the decomposition of carbonic acid, may go on with activity. I support this opinion, first, on general observation of the places where I see the Larch prospering; secondly, on theory. The Larch has fine and minute leaves, and of all Trees which shed their leaves, it must present a less surface; consequently the action of these surfaces must be greater to produce the same results. Larches generally thrive on the declivities of our mountains, seldom on flat places; because on declivities there is always a little dampness in the earth, descending from the surface above; and at the same time, the Trees, on account of the inequality of their bases, have more space on their tops, and are better exposed to the light; whereas, flat places are often too dry, and the Trees being all

Fig. 126—Winter Form of the Larch (*Larix europæa*).

of the same height, overshadow each other." It may be added in conclusion, that almost any soil will suit the Larch.

37

LILAC.

(Syringa vulgaris).

LILAC, we all know, means a particular colour—the colour of the blossoms of the Lilac Tree; but how often one hears people speak inconsequently, of a *white* Lilac—referring to a variety of this Tree bearing white blossoms. It is just as inconsequent as the, by no means infrequent, mention of *red* or *green blacks*berries, *wooden* or *iron* mile*stones* or *iron* lamp-*posts*.

The flowers of the Lilac are borne on what is called, in botanical nomenclature, a *panicle*—a word derived from the latin *paniculu*, which means a tuft. They form a little bunch at the end of a stem, and are succeeded by little capsules (from the latin *capsula*, a chest) of seed which germinate very readily. The Tree is also propagated by suckers, which generally grow up plentifully within a certain radius of the roots. Moreover, they grow in any soil. The flowering usually takes place in May. The leaves of the Lilac are extremely pretty, as our illustration of one will show, and the system of veins is very elegant and striking. The Tree grows to a height of about

Fig. 7.—Leaf of Lilac (*Syringa vulgaris*).

twenty feet, but is not long-lived, seldom existing beyond thirty years in gardens. It lives, however, curiously enough, longer in poor than in rich soils, and in these it may live as long as fifty years. The Trees do not all ripen their seeds, unless the suckers are removed, and the bunches of flowers thinned. Clearly the Tree has a certain amount only of reproductive vitality, and if this goes forth in one direction it is curtailed in another.

An interesting note by Loudon is worth quoting. He says: -"The first time the Lilac was made known to European botanists was by a plant brought from Constantinople to Vienna by the Ambassador Busbequius, towards the end of the sixteenth century. From the plant being very showy, of the easiest culture, and extremely hardy, it soon spread rapidly throughout the gardens of Europe. In some parts of Britain, and various parts of Germany, it is mixed with other shrubs, or planted alone to form garden hedges; and as proof of its hardiness, we may mention that there are hedges of it by the roadsides, in the neighbourhood of Ulm and Augsburg, in the elevated, and consequently cold, region of Bavaria. Mixed with sweet briars, sloe thorns, scarlet thorns, guelder rose trees, etc., it forms beautiful hedges to cottage gardens, when there is abundance of room. In the survey of the Royal Gardens of Nonsuch, planted in the reign of Henry VIII. there is mentioned a fountain set round with six Lilac Trees, "which bear no fruit, but only a very pleasant smell."

THE PERSIAN LILAC *(Syringa persica)*. There are several varieties of this fragrantly-scented tree grown in gardens, and one of these is a dwarf variety, which does reach a height of more than six feet. In pots, it can be kept much smaller, and is so utilised for introduction into conservatories, and into dwelling rooms. A curious method of treatment for keeping them small is to place the pots containing them in an ice house during the month of December, and keep them in the same place up to the following September or October. If then placed in the open air, they produce fragrant blossoms about the following Christmas; but if they are allowed to remain in a hothouse they lose their scent. The explanation of this apparent phenomenon is that the exposure to sunshine out of doors is necessary for the development of the essential oil which produces the scent.

Cowper did not forget this beautiful plant, as the following lines of his will show:

"The Lilac various in array—now white,
Now sanguine, and her beauteous head now set
With purple spikes pyramidal—as if
Studious of ornament, yet unresolved
Which hue she most approved, she chose them all."

38.

LIME.

(Tilia vulgaris).

HARBINGERS of Spring are numerous, but the Lime is the harbinger of Summer. When its beautiful leaves are fully uncurled we may be sure that summer has arrived. Of all the Trees that are grown in towns there are none whose golden green foliage is quite so delicately beautiful as that of the subject of this chapter. It is early in arriving at full leafage and early also in showing signs of discolouration: but whilst its glory lasts it is very delightful. Some years ago the author penned "a study of young Limes," and perhaps he need not apologise for introducing an extract from it here: "Passing along a suburban thoroughfare, the houses in which are fronted by Tree-planted gardens, one is struck by the singular lightness, richness and delicacy of the Lime leaves. It is beauty indeed of a feminine kind: for it is too delicately soft in its character to lay claim to any of the masculine attributes. The eye revels in its luxurious fulness; and conveys to the mind a sense of what has been aptly described as 'inner inexpressible

Fig. 128—Naked Spray of the Lime.

pleasure . . ' Standing under one of the Limes we may look up into the mass of its foliage, and admire and enjoy the delicate beauty and transparency of the leaves. These, attached in alter-

nation to the delicate twigs which support them, are thrown out with a vigour which is surprising, if we remember the extreme delicacy of their conformation. They do not droop, except at their sides and tips. They are thrown out almost horizontally, arched and rounded—convex above, concave towards us; and as we look up we can prove their transparency, for we can see distinctly the forms of some ants which are crossing the arched upper sides. The sunlight increases the transparency, and shows us the beautifully reticulated veins of the leaves. Here indeed, as we come to this minute examination, we shall find singular beauty, worthy of the few moments of our attention. Branching on each of its sides from the midvein which, commencing at the top of the leafstalk, proceeds, in an almost straight line, to the leafy apex are several primary veins which, making an acute angle with the midvein, continue thence to the sharply-serrated leaf margin. The longest of these branch veins are the lowermost, which start from the apex of the leaf-stalk; and these give off veinlets from their lower side, these veinlets being again branched and the branches forked near the leaf margin. The next pair of primary veins are also branched on their lower side, but much less than the ones just described; and the succeeding veins, higher and higher on the midstem, are shorter and shorter and less and less branched as they near the leaf apex. Then, filling the spaces between all the principal or most conspicuous veins, there is a complete network of veinlets;

Fig. 129—Leaf Spray of the Lime.
(*Tilia vulgaris*).

and over the heart-shaped framework constituting the venation of the Lime leaf, is spread the beautiful cellular tissue filled with the colouring matter which gives the charm of its golden green hue to the tender leaf of this delightful Tree."

Having discussed, at unusual length, the Lime's beautiful foliage, which well deserves all that has been said, let us proceed to notice its blossom and fruit. Those who, at midsummer, have looked up into its glorious head of foliage cannot have failed to see—though they are not conspicuous to the uninterested eye the delicate clusters of golden-green balls suspended from their slender verdant stems, branching stems from the summit of a main stem forming what we have already alluded to—a cyme, somewhat like the arrangement of flowers on the Elder Tree, already described. But the Lime blossoms do not grow with the density of the Elder flowers. They are numerous collectively by the great number of their cymes. But each cyme has, usually, no more than seven or eight little green balls depending -for that is their usual habit from seven or eight short stems joined at their bases to the one supporting stem. And this main stem depends in its turn, from the centre of a *bract* which, in the Lime, is a long thin narrow and very pale green leaf, roughly suggesting the "Keys" of other Trees. It is, in fact, a kind of abnormal leaf which springs from the *axil* or, as already explained, the angle made by a leaf-stalk with the twig on which the leaf-stalk is fastened of the other leaves. Through the bract a midvein runs, starting from the short stalk which connects the inflorescence stem, bract and cyme -with the Tree, and proceeding to its rounded apex; and it is from near the centre of this midvein that starts the cyme, forking out and away from

Fig. 130.—Bole of Common Lime (*Tilia vulgaris*).

the membraneous bract. Look against the light at their pale green sheath, now open, and you

will see the delicate veinlets that beautifully branch and fork from the midvein ; and the perfect system of reticulation.

But anon, you pass under the leaves and the green balls have gone, for they have opened into floral crowns, green honey-cups diffusing sweetest odours and offering honey to the bees ; the five-petalled flowers give place to five-celled seed vessels, and in due time, when the ripening comes the wing-like bracts bear away, on the bosom of the wind, the germ-containing caskets—the microscopic storehouses of future Trees.

From the beauty of the Lime, pass we to its usefulness ; and first, as to its leaves and flowers. These have been used as medicine, the former for fomentations, and for other healing purposes—for beautifying the skin by decoctions, and for promoting the growth of the hair—the flowers—infused—as a remedy for colds and fever, gum, oil, sugar and tannin, are also extracted from the flowers of the Lime ; and "tea" and sweet liquor, one resembling chocolate, can also be made from them, whilst the bees obtain from the same source, the finest materials for their honey. From the inner bark is obtained the material known as "bast," used for mats and for tying plants in gardening ; whilst in olden times, Lime bark was used as writing material. Lime timber from its disinclination to warp, is used for the sounding boards of musical instruments ; whilst for many articles of furniture its lightness and delicate colour render it especially suitable. To the wood engraver too—though his art is almost

Fig. 131—Winter Form of the Common Lime (*Tilia vulgaris*).

"lost," owing to the prevalence of "process" work, whilst he himself is almost in the position of Macaulay's New Zealander, reduced to looking at the ruins of his business, unless he can turn his attention to something else—Lime wood, is—or was—valuable, furnishing him with a material, which, delicate to the touch of his graving tools, permits of the most beautiful and faithful delineation.

Opinions differ as to the indigenousness of the common Lime, although the weight of belief—including that of the distinguished botanist, Sir J. D. Hooker, who, in his British *Flora*, endeavours rigidly to exclude everything of doubtful British origin—is in favour of its being a native of Britain. Sir J. D. Hooker does admit *Tilia vulgaris*, within his exclusive circle of plants. But what does it matter when we are concerned with so beautiful a Tree; for in walk, avenue, square and park, it is most sweetly familiar to us, and over the whole of Europe, its beautiful adaptability for association with man, has long been recognised? Though the early decay of its foliage fills the mind with sadly-pleasant recollections of its early beauty, there is still a charm in the richness of its departing hues.

The Broad-Leaved Lime (*Tilia platyphylla*), of which we give an engraving of the bole, needs but a very brief notice, for its leaves are only larger than those of the common Lime, and all that has been just said of the foliage of *Tilia vulgaris* will apply, with the distinction indicated by the mention of its common name.

Fig. 132—Bole of the Broad-leaved Lime (*Tilia platyphylla*).

With the largeness of leaf, a little is wanting of the delicacy of the common Lime. Its bark also

Fig. 133—Winter Form of the White Lime (*Tilia argentea*).

is rather rougher. The one (*vulgaris*) is an inhabitant of the north of Europe, and the other (*platyphylla*) of the south. The young branches of the latter are redder than those of the former.

The White-Leaved Lime (*Tilia argentea*), or as it is alternatively called *Tilia alba*, has a silvery downiness of leaf, which marks its distinction from both the others we have described: but the silkiness is confined to the undersides of the leaves. The flowers too are yellowish instead of greenish white, and they are particularly fragrant. It has also scales on its petals in distinction from the others. It does not grow to so large a size. So distinct a feature is its silvery, or as it looks at the distance, its frosty appearance, that there can be no hesitation in distinguishing it. The quality of the wood and the uses to which it is put, are similar to those of the other two. For purposes of ornamentation, it is admirably adapted, and those who would like to study more closely the characteristics of our three Limes, cannot do better than pay a visit to the beautiful gardens at Kew.

39.

MAIDENHAIR TREE.

(Ginkgo biloba).

A VERY interesting Tree—of which we give engravings, both of winter form and bole—is the subject of our present chapter. Our photographs for the illustrations were from the beautiful specimens at Kew Gardens. It is a Tree very little known to the general public; but it belongs to the same order of plants *Taxaceæ* as the common Yew. It is usually called the Maidenhair Tree—also, however, the Salisburia because of the strong likeness of its foliage to the pinnules of the True Maidenhair Fern, *Adiantum capillus-veneris*, that is to say fan-shaped, with deep and wide crenatures along the edges. In France, this Tree is commonly called *l'arbre aux quarante écus*, or forty-crowns Tree, for the following curious reason—we may as well quote Loudon's interesting recital, which will come to the mind of those readers who may afterwards pay a visit to the Tree at Kew: "In 1870, a Parisian amateur, named Pétigny, made a voyage to London, in order to see the principal gardens; and, among the number of those he visited was

Fig. 134.—Bole of the Maidenhair Tree (*Ginkgo biloba*).

that of a commercial gardener, who possessed five young plants of *Ginkgo biloba*, which was still rare in England, and which the gardener pretended

that he then alone possessed. These five plants were raised from nuts that he had received from Japan; and he set a high price on them. However, after an abundant *dejeuner*, and plenty of wine, he sold to M. Pétigny, these young Trees of *Ginkgo*, all growing in the same pot, for 25 guineas, which the Parisian amateur paid immediately, and then lost no time in taking away his valuable acquisition. Next morning, the effects of the wine being dissipated, the English gardener sought out his customer, and offered him 25 guineas for one plant of the five he had sold the day before.

"This, however, was refused by M. Pétigny, who carried the plants to France: and, as each of them had cost him 120 francs, or forty crowns (*quarante écus*), this was the origin of the name applied to this Tree in France, or *arbre aux quarante écus*; and not because it was originally sold for 120 francs a plant. Almost all the *Ginkgo* Trees in France, have been propagated from these five, imported from England by M. Pétigny. He gave one of them to the *Jardin des Plantes*, which was kept for many years in a pot and preserved through the winter in the greenhouse, till 1792, when it was planted out by M. André Thouin, who gave the above relation in his lecture; but as the situation was not altogether favourable to it, this plant was not much above forty feet in height in 1834, and had not then flowered. There is another *Ginkgo* in the *Jardin des Plantes*, which was raised by layering from one of the five imported by Pétigny.

Fig. 135—Winter Form of the Maidenhair Tree (*Ginkgo biloba*).

Though much later planted than the other, yet, being in a better situation, it is about the same size, although it has not flowered. The first

Ginkgo which flowered in Europe, appears to have been a male plant at Kew, in 1795; and, shortly after, Mr. Dillwyn informs us, a male plant flowered at Ham House, in Essex."

The Maidenhair Tree produces its male and female blossoms on different Trees. The male catkins are about an inch and a half long, and yellowish in colour, whilst the female flowers are produced in a cup-like organ, and the resulting berries are in appearance not unlike acorns, and each is about an inch long. *Ginkgo* wood is yellowish in colour, veined and close-grained, something like deal, but without the resinous smell of deal; and as it is easy to work, and will take a good polish, it is utilised for the manufacture of some small articles, but is not produced in sufficient quantity to become a marketable timber.

40.

MAPLE.

(Acer campestre).

MORE frequently seen as a common hedge-side shrub, the common or Field Maple, as it is rather appropriately called, is, nevertheless, a veritable Tree, although it is seldom seen in this country of a large size. The one whose winter form and bole we give illustrations of, is an exceptionally fine specimen growing in Kew Gardens. Gilpin's grave in Boldre Churchyard, New Forest, is placed under a Maple which was his favourite Tree, and for some years he was vicar of this same church at Boldre. Writing of it in his *Forest Scenery*, he says: — "The Maple is an uncommon Tree, though a common bush. Its wood is of little value, and it is, therefore, rarely suffered to increase. We seldom see it employed in any nobler service than in filling up its part in a hedge, in company with thorns and briars and other ditch trumpery. Pliny speaks as highly of the knobs and excrescences of this Tree, called the *brusca* and *mollusca*, as Dr. Plot does of those of the Ash. The veins of these

Fig. 136—Leaf of the Maple
(*Acer campestre*).

excrescences on the Maple, Pliny tells us, were so variegated that they exceeded the beauty of

any other wood, even of the Citron ; though the Citron was in such repute at Rome that Cicero, who was neither rich nor expensive, was

Fig. 137—Naked Spray of the Maple.

tempted to give ten thousand sesterces for a Citron table. The *brusca and mollusca*, Pliny adds, were rarely of size sufficient for the larger

furniture ; but in small cabinet work they were inestimable. Indeed, the whole Tree was esteemed by the ancients on account of its variegated wood. In Ovid, we find it thus celebrated : —*Acerque coloribus impar* (the Maple stained with various hues). How far, to this day, it may be valued for cabinet work, I know not" (this was written over a hundred years ago). "I have, here and there, seen boxes, and other little things made of it, which I have thought beautiful. But I am told that in North America, where it grows wild, it is in much esteem. When the cabinet maker meets with a knotted Tree of this kind, which is there called the Curled Maple, he prizes it highly. In the few instances I have met with of this Tree in maturity, its form has appeared picturesque" (a character that will certainly apply to the subject of our engraving). "It is not unlike the Oak, but is more bushy, and its branches are closer, and more compact. One of the largest Maples I have seen stands in the churchyard of Boldre, in New Forest ; but I have not met with specimens enough of this Tree to form an opinion of its general character."

Old Maple bark is corky and fissured, but the branches generally, that is to say, the smaller and younger ones, are very smooth. The leaves are extremely pretty and smooth, very much in general appearance like those of a much more common and better known Tree, the Sycamore—*Acer pseudo-platanus* —which belongs to the same genus. But Maple leaves are smoother

and more glossy, on both surfaces, than those of the Sycamore. In the deep indentations dividing the lobes of its leaves, *Acer campestre*

Fig. 138—Leaf Spray of the Maple (*Acer campestre*).

somewhat resembles the Plane the Sycamore leaves much more so, and hence its specific botanical name of *pseudo-platanus* (the false

Fig. 139 Bole of the Maple (*Acer campestre*).

plane) but there is a conspicuous rotundity in the lobes of the Maple leaves, not noticeable in the Sycamore, whose leaf margins are rather sharply indented. The venation is very beautiful—

a principal vein running into each lobe, and giving origin to branch veins, that extensively fork as they go to the edge. Curious little marks like red

Fig. 140—Winter Form of the Maple (*Acer campestre*).

pimples, are frequently found scattered over the leafy surfaces. These are tenanted by some insects, by whose action they have been pro-

duced, after the manner of what are called oak "spangles."

The yellowish-green flowers of the Maple are borne in little erect clusters, and are surrounded by what are popularly called "keys," small wing-like bodies enclosing the seeds. As to the wood of this Tree, it takes a good polish, is compact and fine-grained, and is used by the cabinet maker for various articles of furniture—the beautiful veining of parts of it serving for purposes of ornamentation in manufacture.

THE SCARLET MAPLE (*Acer rubrum*) is a handsome Tree; and is especially noticeable on account of its scarlet blossoms, which expand more than a fortnight before the leaves unfold. It is not a species that is generally met with, except in private collections. In the United States -from which it was introduced to this country about the year 1656 it is plentiful, and there it comes into flower as early as the middle of April. In America, the Tree finds a good deal of employment, and it is interesting to note that many years ago it was largely employed there in lieu of mahogany. The wood is harder than that of other species of maple, and its grain is close and fine; but in this country its use as a timber Tree does not seem to have been generally discovered, and it is mainly, and one may say exclusively, grown for purposes of ornamentation

41.

MEDLAR.

(Mespilus germanica).

FOR its fruit is the Medlar chiefly prized, and that, curiously enough, is uneatable unless kept until it is nearly rotten, when it possesses a pleasant acidity, pleasing to some palates. The tree itself is a picturesque one, and the large white flowers, in the blossoming time, give it ornamental qualifications for garden or lawn. The leaves, of which we give an illustration, are narrowly oval in shape, pointed at the apex, short-stemmed. They are even on the edges, and prettily veined, the colour being a delicate green. The veinlets are given off on each side of the mid-vein, and observe a forked wavy course to the leafy margin. They are very soft and downy on their undersides. The blossoms are five-petalled, and appear singly on the twigs. The fruit, with its dark-brown skin, is pretty well known—the five seeds, which each contains, being enclosed in a five-celled receptacle. This plant can be grafted either on the hawthorn, the wild pear, or the quince, and it grows pretty readily in almost any soil. It only attains a

comparatively small size, but is to be found growing wild in certain parts of England, notably

Fig. 141—Leaf Spray of the Medlar (*Mespilus germanica*).

in the counties of Chester, Kent, Surrey, and Sussex. It grows wild also in other parts of

Europe, and in the western parts of Asia. Blossoming takes place in May or June, and the fruit is usually ripened rather late—in October or November. Loudon remarks that the Medlar has been cultivated in British gardens for an indefinite period. A curious explanation is given of the origin of the generic name of *Mespilus*. It comes from two words, *mesos*, a half, and *pilus* a bullet; in allusion to the fruit being like half a bullet.

42.

MOUNTAIN ASH.

(Pyrus aucuparia).

ANY Tree that invites poetical notice, is pretty sure to possess something interesting, either in its appearance or its associations, historical, or otherwise; and Wordsworth certifies to the attractive "personality" if such an expression may be allowed of our present subject, in the following lines:—

> "The Mountain Ash
> No eye can overlook, when 'mid a grove
> Of yet unfaded trees she lifts her head,
> Deck'd with autumnal berries that outshine
> Spring's richest blossoms; and ye may have mark'd
> By a brookside or solitary tarn,
> How she her station doth adorn; the pool
> Glows at her feet, and all the gloomy rocks
> Are brighten'd round her."

But it is essential to state at once, that this Tree which adds, as Wordsworth says, so much splendour by its brilliant fruit to autumnal landscapes, is not an Ash, and is in no way related to *Fraxinus excelsior*, its common name being given to it, owing to the general resemblance of its foliage to that of the Ash. We say general

Fig. 142—Naked Spray of the Mountain Ash.

resemblance, because the likeness is only in the pinnate form of the leaves—opposite pairs of leaflets along the mid stem with a terminal leaflet.

Mountain Ash leaves are handsomer than those of the Common Ash, and are beautifully serrated, instead of being plain at the edges. Another name for our Tree is Rowan or Roan Tree, a name prevailing in Scotland. Further common names are "Quick Beam" and "Fowler's Service Tree"—the latter designation being applied to it because "birdlime" is manufactured from its berries. Superstition used to account the Rowan an antidote against witchcraft, and this is incidentally referred to in some lines in an old song:—

> "Their spells were vain; the hags returned
> To the Queen in sorrowful mood,
> Crying that witches have no power,
> Where there is Roan-tree wood."

If Shakespeare suffered from "printer's errors," we might endorse the suggestion that when Macbeth is "reported" to have said, "Aroint thee, witch!" he really meant to say: "A roan tree witch." Whether or not the immortal poet (who is the sole authority for the existence of the word "aroint," imported into dictionaries on his origination only) really meant to say "a roan tree witch," the suggestion of error, and the explanation are, at least ingenious.

Our "portrait" of the Mountain Ash was taken from a comparatively young Tree, and perhaps does not present the picturesque form it assumes "when age creeps on." Its bark is grey and smooth. It is rather a rapid grower, and will reach to nine feet in about five years, but it does not ordinarily grow much beyond twenty feet, and

after about 100 years, it begins to decay. The creamy white flowers are borne profusely on cymes,

Fig. 143.—Leaf Spray of the Mountain Ash (*Pyrus aucuparia*).

and very much resemble those of the pear. The brilliantly scarlet berries succeed. So powerful is the delicious perfume of the flowers, that when

Fig. 144.—Winter Form of the Mountain Ash (*Pyrus aucuparia*).

the Trees are numerous on any hillside or woodland, the air for a long distance around is impregnated with it.

Of the uses of this interesting Tree, it may be said that the timber being fine-grained and hard, and capable of polishing, is available, as it can be easily stained any colour for the manufacture of many small articles; for handles to knives and forks, for wooden spoons, for musical instruments, axletrees, naves and felloes of wheels, handles for tools, walking sticks, and cogs for mill-wheels, where wood is still used for that purpose.

Animals and birds feed readily on the "rowan" berries, which can also be made into preserves for domestic consumption To the taste they are rather acid, and possess astringent properties. Spirit also can be manufactured from the berries. For ornament in garden, park or woodland, it will readily be understood, from what has already been said, that the Mountain Ash is a most suitable Tree. It can easily be raised from seed, which, however, takes some little time to come up; but if, after gathering, they are mixed with light sandy soil, and spread out and exposed to the air and rain for some time they will, if planted during the winter season, from November to February, spring up the following June.

43.

MULBERRY.

(Morus alba).

BRIEF mention must be made of a Tree that not only provides delicious fruit, but leaves which are a staple food of the interesting insects that supply the world with one of its most prized and costly articles of commerce. Thousands of children who may never have seen Mulberry fruit, are familiar with the pretty, dark-green, heart-shaped Mulberry leaves, the favourite food of the well-known silkworm. The Mulberry is amongst the latest Trees of the garden or plantation to put forth its leaves. One of the suggested derivations of the generic name *morus*, is that it comes from the Morea, whose shape is something like that of a Mulberry leaf. Another is that it simply comes from the Greek word *moron*, signifying a Mulberry or Blackberry; and a third suggested origin is from the word *mauros*, dark, in allusion both to the colour of the leaves, and to the colour of the berries of the species *nigra*, *Morus nigra* being commonly called the black-fruited Mulberry. All the species can be propagated either by cuttings, by layers, or by seeds;

but the one of the several kinds best suited for the food of the silkworm, is the subject of our

Fig. 145—Leaf Spray of the Mulberry *(Morus nigra)*.

present chapter. The Tree abounds in a wild state in China, and is believed to have only

Fig. 146 Winter Form of the White Mulberry (*Morus alba*).

been naturalised in Europe and Asia. The Chinese, in fact, were the first nation to cultivate the Tree for the purpose of silk production, and

it is alleged that they discovered the art of making silk, 2700 B.C., in the reign of the Emperor Hong, to whose Empress the discovery was due, her majesty having noticed the worms on the Trees and made arrangements for applying the silk for human use.

Of the wood of the Mulberry, it can only be said that it is valued for making the staves of wine casks, as it is alleged that it gives a violet-like flavour to white wine.

It may be added that the tenacity of silk is said to be due to the fact that the juice of the leaves of the Tree is of a milky character, and abounds more or less—according to the climate in which they are grown—in the properties of caoutchouc.

44

OAK.

(Quercus pedunculata).

AMONGST all our woodland Trees, the Oak is pre-eminent for the noble qualities of strength and endurance: and there is no other native Tree whose history is so closely interwoven as is that of this King of the Forest, with the record of our national life of its

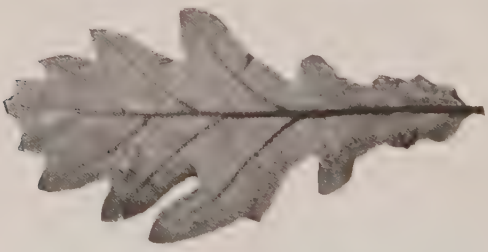


Fig. 147.—Leaf of the Common Oak (*Quercus pedunculata*).

struggles, of its progress, of its development. Looking back to that early period when our island was covered, from sea border to sea border, with almost unbroken woods, and reading on the page of history what has been gathered there by our earliest writers, we see, standing out, as it were,

vividly against the other inhabitants of ancient British woodlands, the noble and stately form of

Fig. 148—Naked Spray of the Oak and Oak Apple

the Oak. A charming writer has appropriately said that this beautiful Tree is not *only* a Tree,

but "a garden and a country." It is a garden which offers a place to smaller plants, and provides a home for birds and insects, whilst, in a broader sense, it is a country with a history. Could the records of the plant, bird, and insect life inhabiting the Oak, made each year—spring, summer, autumn and winter—during one century of the Tree's existence, be obtained for us, what a world of interest would be opened up before the lover of nature! But the life of an Oak is extended over a period far longer than a century, enduring through events which make up a considerable portion of the world's history. Dryden says of this noble Tree :—

> "Three centuries he grows ; and three he stays,
> Supreme in state ; and in three more decays."

And although this indicated term of nine hundred years, expressed as the limit of Oak life, may be said to comprehend the average duration of the monarch of our woodlands, when growing undisturbed, under favourable conditions, there are recorded instances of Oaks which have lived beyond a period of fifteen hundred years!

Of our present woodland Oaks, two are natives of Britain, and of these, the most important is the one which forms the subject of this chapter, commonly called "the wavy-leaved Oak." The generic name *Quercus* is compounded of two Celtic words, meaning "a fine Tree."

The specific name, *pedunculata*, has been given to the present species on account of the circumstance that the fruit or acorn is borne upon a slender and delicate *peduncle*, the name given to

the stalk or stem upon which the flower or fruit of plants is borne—the acorn stem in this species being oftentimes several inches in length.

Fig. 149—Leaf Spray of the Oak (*Quercus pedunculata*).

The fruit of the species to be described in the next section of this chapter is generally, unlike

that of *pedunculata*, entirely deprived of a stem; and being what is termed *sessile*—a word derived from the latin *sessilis*, "sitting" —because it "sits" without intermediate stalk upon its support, the specific distinctive name of *sessiliflora* has been given to it. Whilst most botanists adopt this specific name for the flat-leaved Oak, some of their number designate the species now being described *robur*, instead of giving it the consistently distinctive name of *pedunculata*. The word *robur* is derived from a latin word meaning "strength," and would thus be applicable to oaks in general, and would not be so clearly distinctive as the word *pedunculata*. It will be interesting to note in this connection that the common English name Oak is derived from the Saxon *ac*, from which word we derive the name of the Oak fruit -the *ac* corn or corn of the *ac*. Though *ac* has become in modern English, Oak, the Saxon name is still retained in other words, as, for instance, in Acton, which means Oaktown.

To the ancient Greeks, no less than to the ancient Britons, the Oak was a prominent inhabitant of the forest; for the Greek word *drys*, although meaning generally a Tree, had especial reference to the Oak, and hence came the word dryads to indicate the fairy inhabitants, or nymphs, of the wood. From the Celtic word *derw*, meaning the Oak, came also the name *Druids*, the priests of ancient Britain, whose mysterious and cruel rites were performed under the shadows of the Oak Trees of old England. The sacred groves of the Druids were all of Oaks.

Fig. 150—Bole of the Common Oak (*Quercus pedunculata*).

They planted and cultivated these Trees, worshipped under them, and sacrificed their victims under them. The Druids claimed the

right to maintain perpetual fire, and once each year they compelled the people to put out all their fires; but permitted them to rekindle them from the yule logs of the priests—this annual rekindling taking place on November eve, or the last day of October. The Yule log was of Oak, and was kept burning on the Druidical altar—a stone structure erected under the spreading arms of the Tree which was the object of ancient British veneration and worship. The altar of the Druids—the "Cromlech"—was rudely formed of upright stones, with a stone or stones resting horizontally on the supporting ones, after the manner of a table. Whilst the stem of the British Oak was used for the yule log, the leaves of the Tree furnished the priests of ancient Britain with the chaplets, which were always worn on their brows, during the performance of their religious rites. The curious parasite of the Oak, the mistletoe, was also, in British eyes, a sacred plant. As now, so in the time of the ancient Britons, the mistletoe was not found growing plentifully on the Oak, and hence the search for it was a solemn and ceremonious proceeding, the Druids going forth—after the performance of certain rites, dressed in robes of white—to find it in their sacred groves, and provided with golden knives, to sever it from the Oak. The judges, too, in ancient Britain, administered justice under the spreading arms of the sacred Tree, the prisoners being compelled to stand within a circle drawn around the circumference of the stem, by the wand of the presiding Druid. Following the custom, which,

amongst the ancient Britons, made the Oak a national Tree, the Anglo-Saxons had their popular gatherings under shelter of the monarchs of their

Fig. 151.—Winter form of the Common Oak (*Quercus pedunculata*)

woodlands : and from the time of Saxon-England until now, the noble Tree has, in ways innumerable, prominently figured in our history.

The strength and durability which give the Oak its pre-eminence amongst our woodland growths, are qualities which are slowly gathered, for its rate of progress is, ordinarily, not more than enough to add one inch each year to its circumference. Yet its especial characteristic is stoutness, both of trunk and branch. It is not remarkable for height, though instances have been recorded in England of Oaks attaining a height of more than a hundred feet, with nearly seventy feet in length of trunk. The stoutness of its trunk, however, is usually its striking feature. It is wider at the base, and at the top of the trunk, than it is midway, and this depression in mid stem is formed by a symmetrical curve. The massiveness, solidity, and strength of the Oak bole are qualities, which enable the Tree to bear the enormous superincumbent weight of its branches, and also to bear the peculiar strain caused by the habit of the latter in growing out to a considerable distance, almost horizontally from the top of the trunk. The twisting and contortion of its branches is another feature of its growth, and one which gives to old Oaks their gnarled and rugged appearance. Owing to its main, or "tap root," descending to a considerable distance in the earth, and sending out, horizontally, powerful branches, it is enabled to take a very firm hold upon the ground. Hence it is found to be the least likely of all our forest Trees, to succumb to the force of the tempest; and this tenacity is all the more remarkable on account of the large surface which is presented

to the wind by its enormous head of spreading branches. It was the form of the Oak trunk which suggested to Mr. Smeaton, a model for

Fig. 152—Leaf Spray of the Flat-Leaved Oak (*Quercus sessiliflora*).

the construction of his famous Eddystone Lighthouse, because of his belief, that it was the form best calculated to resist the force of high winds.

The waviness of the surface, and of the large-lobed outline of the roughly oval-shaped leaf of *Quercus pedunculata*, gives origin to the common name of the species. There is a tortuousness in the venation of the leaf of *pedunculata*, suggestive of the tortuousness of the Tree on which it is borne, and though, in the early spring, there is beauty in the tender golden green of its colour, it is not, and cannot be regarded by comparison with leaves of many another Tree as, a handsome leaf when it has attained its normal size, and its colouring of sober green. The leaf-stem in *pedunculata*, is either entirely absent or very short. One peculiarity connected with the foliage of the Oak, is, that, though the Tree is deciduous, it sometimes experiences a second spring, when by accidental circumstances, the leaves are prematurely removed. On the occasion of a great storm, which took place in Cornwall, in the month of August, 1844, the foliage of a number of Oaks shrivelled up, and died a few hours after the storm. Very shortly afterwards, however, new leaves began to take the place of the old and destroyed crop. The same phenomenon has also been witnessed in the case of Oaks whose leaves have been destroyed by cockchafers or other insects. Another peculiarity of the Oak foliage is, that in young Trees, it remains on the twigs long after the autumn discolouration has set in, and it is supposed that, in this way, nature affords a protection from cold to the incipient buds, which, in the Oak, as in many other Trees, are formed long before the time of opening.

Fig. 153.—Bole of the Flat-Leaved Oak (*Quercus sessiliflora*).

Following closely, in spring, on the opening of the earliest leaf-buds, come the Oak flowers.

These are of two kinds, are greenish-white in colour, and form what are called catkins. We have already defined a catkin; but to make it abundantly clear, by repetition, we may add that a catkin is a kind of spiked inflorescence, or system of little flowers: a cluster of tiny flowers, in fact, borne like a tassel on a delicate thread-like stem. It usually grows near the extremity of the Tree stem, and it hangs dependent from the twig on which it is fastened, drooping gracefully like fringe. The first Oak catkins which appear, as we have said, almost contemporaneously with the first young leaves of spring, contain only *stamens*—the male organs of plants, furnished with the mysterious fertilizing dust, or pollen. Then follow smaller and less conspicuous catkins, bearing the *pistils*—the female organs of plants—with their accompaniment of ovaries—the fruit or seed—which in the Oak, as we know, is the acorn. The rudimentary acorns in the seed-catkins are, at first, tiny little bodies. When stamen-bearing catkins have performed their office of shedding pollen, they drop from the Tree. But the acorn catkins remain, and develop into the fruits—the beautiful "Corn of the Oak," seated in their elegant cups. In times past the acorn has served, not only for the food of many of the wild inhabitants of the woodlands, but of man. What schoolboy does not remember the taste of the Oak fruit?

Not least amongst the characteristics of the Oak are its "apples" and its "galls"—abnormal vegetable growths on stem, on leaf, and even on

Fig. 154—Bole of the Chestnut-Leaved Oak (*Quercus cantaneafolia*).

fruit, and about which there is much mystery. The Oak "apple"—so called—is often beautifully

coloured with shades of brown and pink, deriving its name from a rough resemblance to the fruit of the Apple Tree. It is formed by the action of small insects, called Gall flies—one of which is *Cynips quercus inanis*. This fly punctures the tender skin of the Oak twig, or sometimes the leaf bud, and in the hole thus made by its ovipositor, it lays its eggs. The act disturbs the sap which pours from the trunk into the wounded twig, causing it to flow round the foreign substance of the eggs, solidifying as it flows, and encompassing the eggs with soft vegetable tissue, but leaving room enough for the little grubs, which are soon hatched, become flies, make their way to the surface, and take flight. Sometimes an ichneumon fly, lays its eggs in the bodies of the enclosed grubs, and when these eggs are hatched, the resulting worms feed on the bodies of their predecessors, and themselves, in turn becoming flies, make their escape from their vegetable house. The round "Oak Galls" familiar to everybody, are formed in a similar manner by the action of insects, which perforate the Oak twigs. These galls, at first green, soon become brown, and the holes which are usually found in them, indicate the passages by which the enclosed insects have escaped to light and air: or probably it would be more correct to say, to more air, for it must be assumed that a certain amount of air may find its way through the substance of the galls.

The currant-shaped galls, known as "flower galls," are also made by the action of a fly, which selects, for the deposit of its eggs, the stamen-

Fig. 155—Bole of Lucombe Oak
(*Quercus lucombiana*).

bearing stalks of the Oak catkins. When there are several of these little galls on one catkin, the latter have much the appearance of a bunch of currants;

and it is a very curious fact, that the existence of these galls prolongs the existence of the catkin stem, which ordinarily drops from the Tree, so soon as it has shed its pollen. Where, however, it is covered by flower galls, the catkin remains attached to the twig on which it grew during the lifetime of the enclosed grubs. This incidental action of the catkin has generally been regarded as a phenomenon impossible to explain. The present writer, however, ventures upon a solution of an apparently unexplainable "mystery." It is suggested that the same impulse of nature which follows up the accidental puncture of an insect with the production of a kind of vegetable monstrosity—causing sap to flow and vegetable tissue to be formed—where they would not otherwise flow or form, operates similarly in the case of the catkin. Ordinarily when the catkin's office has been performed, it dies; but the superposed friction of the fly, in puncturing a catkin just before the time of its disappearance, sets up a new action—produces, so to speak, an irritation that stimulates the plant organs, compelling or inducing them to maintain vital action that would otherwise cease.

It is very little that this explanation advances. It is, in fact, not an explanation but merely an inference; and the wonderful action of nature in co-operating, as it were, with the proceedings of a small insect, still leaves us plunged into one more of the mysteries of the Divine Mover in all mundane things!

Similar excrescences to those of the currant-shaped "flower galls" are also found attached to

Fig. 156—Bole of the Willow Oak
(*Quercus phellos*)

the leaves of the Oak. But these—"leaf galls" as they are called—are sometimes larger than the

normal currant size, probably on account of the more abundant flow of the sap of the Tree into its leaves. An Oak bud is sometimes made the depository of an insect's egg, and then is formed a curious cone-shaped excrescence to which the name of "artichoke gall" is given. Sometimes galls are formed on the trunk of the Oak, just above the ground, by an insect, and the leaves of the Tree are often covered by small red excrescences called "Oak spangles." These, also, owe their presence to insect action. The acorn, too, is frequently punctured by an insect, and what is called a "nut-gall" formed; but within every gall there is the enclosed egg, grub, or fly

A volume might almost be filled with a description of the uses of the Oak as timber. In its qualities of hardness, toughness, strength and durability, Oak wood excels the wood of any other British forest Tree. Other wood may be mentioned which is harder, other which is tougher: but none which so excellently combines these qualities; and in the power of resisting decay, Oak wood has no rival. A host of instances could be given in proof of the enduring qualities of Oak, and from these it may be safely deduced that in the same degree in which this noble growth of the forest retains its grasp upon life, its wood is endowed, when cut from the trunk, with the power of resisting the growth of decay.

The flat-leaved Oak (*Quercus sessiliflora*) is not so abundant in these Islands as the one last described, and although probably there is not

much difference in the quality of the timber of the two Trees, the comparative scarcity of the one now under notice has led to the inference that its wood was formerly preferred to that of *Quercus pedunculata*; but preference in our days appears to incline rather in favour of the last named. Loudon says: "According to most authors and observers, there is little or no difference in magnitude or general appearance between the entire full-grown Trees of *Quercus pedunculata* and *Quercus sessiliflora*; though some affirm that the former is a low spreading tree and the latter a conical one. . . We are strongly inclined to believe that there is no important and constant difference between the mode of growth of the two species; because we have found individuals of the one species as pyramidal, fastigiate" (all the parts nearly parallel and pointing upwards) "or orbicular" (perfectly circular) "as ever we have found any of the other." He considers that the two Trees "though sufficiently distinct as to be considered two species, yet being very generally found growing together in a wild state, and being used indiscriminately for all the purposes to which the Oak is applicable, may be most conveniently treated of together."

Our own opinion, derived from observation of the two Trees, does not quite accord with that of Loudon. The Wavy-leaved Oak is of slower growth than its rival, and as we find that it is slowness of growth that usually promotes the solid and enduring qualities of timber, it may be assumed, with some reason, that the qualities of

toughness and endurance are likely to be more pronounced in the slower-growing *Quercus pedunculata*. The Flat-leaved Oak is a more beautiful Tree than *pedunculata*. It grows straighter and more gracefully in trunk, limb, and branch, than the wavy-leaved species. There is not the same contortion of limbs and boughs—for its branches all grow in more parallel planes, and its foliage is more symmetrically and evenly turned, and does not exhibit the sort of dishevelled appearance conspicuous in *pedunculata*. Its individual leaves, too, are larger and brighter, more regularly lobed, more vivid in colour and more glossy. There is more grace, too, in their venation—the veinlets, branching from both sides of the midstems, proceeding in straight lines and with more regularity than is the case with *pedunculata*. The term "flat-leaved" Oak, applied to *Quercus sessiliflora*, is not so suggestive of leafy beauty as that of "wavy-leaved," applied to the other species. But, in reality, the waviness of the leaf of *pedunculata* arises rather from a ruggedness of surface a quality characteristic of the Tree; for, in all ways, *sessiliflora* has the handsomer leaf, whether we regard its individual beauty or the clustering compactness of the foliage as a whole. A prominent characteristic in the latter is the presence of leaf-stalks absent from its rival. But, on the other hand, the acorn, as we have seen, is without a stalk, or, at most, is provided with a very short and imperfect one; and hence the specific name of *sessiliflora*. It has been noticed, both in this country and on the continent of Europe, that

pedunculata is usually found growing on better soil than *sessiliflora*, and this preference of the Tree for good soil will, perhaps, account for its more perfect growth, and for the superior quality of its timber. But what the present species may lose in the quality of its wood it gains in picturesqueness and beauty.

The Bitter, or Mossy-cupped, Oak (*Quercus cerris*), perhaps more frequently called the Turkey Oak and represented in the Royal Botanical Gardens at Kew by several very fine examples, is a handsome Tree deriving the popular name with which we have headed our description from two circumstances—the bitterness of its acorns and the mossy fringes with which the acorn cups are adorned. It usually attains the same height as those already described, but is a more vigorous and a more rapid grower. We give illustrations of the Tree in Winter, of the bole and of the leaf. As will be at once realised, the leaf is long, narrow, widely lobed and very different from the Oaks already named; so that in summer it can be immediately identified. This Tree has been in this country since the year 1735. It generally begins to flower in April, and the acorns are fully grown and ripe sometimes by the following October, but more frequently in the second year. There are a number of varieties of this Tree, which has a great tendency to (what is called) "sport" if propagated by seed—a peculiarity common to a good many plants. It is nature's provision for variety, one of the great charms without which

there would be a wearying tameness in the world. To preserve and continue the normal form propa-

Fig. 157—Leaf of the Turkey Oak (*Quercus cerris*).

gation must be continued by layering. Loudon gives an interesting description of *Quercus*

Fig. 158—Bole of the Turkey Oak
(*Quercus cerris*).

cerris, indicating its especial characteristics. He says :—" The Turkey Oak is a fine growing

Tree, with straight vigorous branches which take a much more upright direction than those of the British or common oak; and both branches and twigs are, in every stage of the Tree's growth, wholly free from the tortuous character of those of that species. The trunk is also straighter; but the branches at their junction with it, being remarkable for an unusal degree of expansion, the trunks of middle-aged trees often appear *gibbous*"—which means hunched or humped. "The bark is comparatively smooth and dark when young, but corky as it grows old; and it is reckoned less liable to crack than that of the Common Oak. The leaves are of a beautiful bright shining green, somewhat glaucous, and hairy beneath; and they vary so exceedingly in size and shape in different Trees raised from seed that almost every individual, if described from the leaves alone, might be considered a distinct species; they have short footstalks, and are most readily distinguished from those of Oaks of every other section by their small buds, and the numerous linear persistent stipules which proceed from them. The acorns are sessile, or on very short footstalks; and they are easily known by the bristly or mossy clothing of their cups. They are remarkably bitter and austere."

The Turkey Oak is not nearly so long a liver as our native kinds of Oak, and it deteriorates after 60 or even after 50 years of growth—a feature which very markedly distinguishes it from them. Probably there is not much difference in the timber; but an interesting note on this sub-

Fig. 159—Winter Form of the Turkey Oak (*Quercus cerris*).

ject is given by one writer, Mr. Atkinson, quoted by Loudon. This authority says he considers the

wood of the Turkey Oak is "much finer in the grain than that of our British Oak. It takes a better polish, and is more beautiful than any other Oak that I have ever seen. From only a single specimen, which I had broken, it was not so strong as our native Oak, but equal in toughness; but my specimen being rather cross-grained, it was not a correct experiment, and I suspect it is equal in strength to our Oak. For all ornamental purposes, when the wood had to be polished, it is superior; and must be a profitable Tree to plant, as it grows much quicker than our Common Oak; and I have seen it thrive rapidly on poor lands."

THE LUCOMBE OAK (*Quercus lucombiana*), and alternatively called the Evergreen Turkey Oak, the Devonshire Oak, and the Exeter Oak, is so called because it was raised by Mr. Lucombe, a nurseryman of Exeter, from seeds sown about the year 1762. It is a rapid grower and has been propagated rather extensively in Devon, Cornwall and Somerset. This particular species of Oak is believed to be a cross between *Quercus cerris* and the Cork Oak, *Quercus suber*, and the chief noticeable difference between it and the one last described arises from the fact of its being what is called sub-evergreen; but there is a curiosity to call attention to, namely, that in May, when the fresh leaves come out, the old ones, still both green and fresh, are — to quote Loudon — "entirely and simultaneously cast off, so that the Tree appears bare; so rapid is the change, that a few days suffice to clothe it afresh in full verdure." He

adds:—"Therefore, although these varieties are, to a great extent, decidedly evergreen they cannot strictly come under that denomination! The bark is very corky, and the leaves are long and of a blackish green colour." Another writer, Mr. Prince (partner in the Exeter nursery with Mr. Lucombe), says in writing to Loudon: "I wish to call your attention to the specimens of bark of the new evergreen Lucombe Oaks, which I send you herewith. You will observe that they are very corky. The produce of hybrids often assimilates to one parent more than to another: and thus in the varieties of the new Lucombe Oak alluded to, there is a great assimilation to the male plant (*Quercus suber*), in the thickness and texture of the bark, the density of the wood, and the dark green, almost black, evergreen foliage; whilst in the conical shape of the Tree, and its rapid growth, the habits of the female plant (*Quercus cerris*) are retained." There is a very fine specimen of this Oak -we may add in conclusion—in Kew Gardens.

The Chestnut-leaved Oak (*Quercus castaneaefolia*), of which we give an engraving of the bole, photographed from a fine specimen at Kew, is remarkable, as both its botanical and common name imply, for its chestnut-like leaves, probably the most beautiful and elegant of all Oak foliages. They are long, oval, sharply indented, and glossy, and very closely resemble the leaves of *Castanea sativa*. The Trees grow freely in this country, but the leaves are rather noticeably deficient in

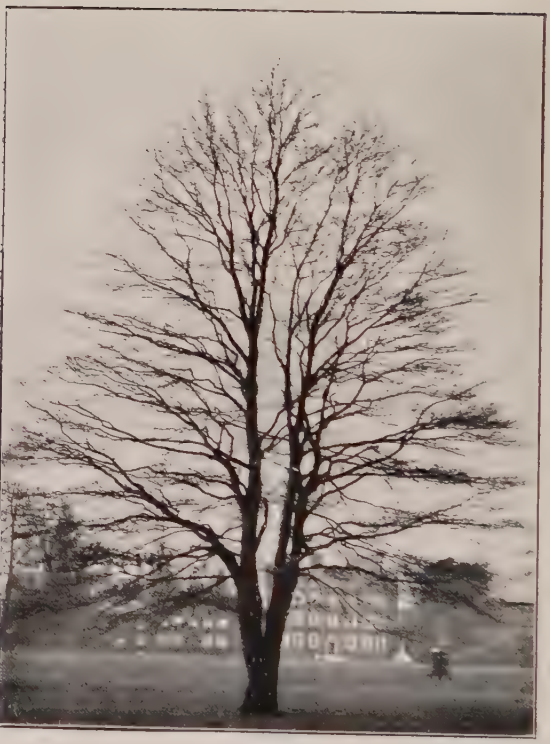


Fig. 160—Winter Form of the Willow Oak (*Quercus phellos.*)

colouring in autumn, generally dying off with a whitish or brownish yellow hue, and wanting in

the fiery glow of most autumnal oak foliage. They are handsome Trees and though they are not grown to a very large size, seldom exceeding 90 feet, are available for ornamentation in small grounds. The bark is rough, white and rather scaly, and the Tree generally produces large acorns.

The Willow Oak (*Quercus phellos*), of which we give engravings of winter form and bole—pages 316 and 305—is a very handsome Tree, especially in its young state. The leaves, as its common name implies, are somewhat like those of the Willow, being long, pointed and entire (that is unindented) on their margins. They are about two or three inches long, light green in colour and smooth on their surfaces. The twigs, too, imitate those of the Willow, and are straight, smooth, and very symmetrical in their branching—in this respect differing largely from the generally twisted and contorted character of Oak ramification. The acorns are small, round in shape, dark brown in colour, and—like those of the Turkey Oak—bitter to the taste. They grow in shallow cups, slightly scaly. The wood is coarse-grained in texture, and of a reddish colour, but is porous—a character explained by its rapidity of growth; and for that reason, although put to many unimportant uses, has not the excellent character of Oak timber in general.

45.

PEAR.

(*Pyrus communis.*)

PLEASANTLY familiar to everybody as are the cultivated garden descendants of *Pyrus communis*, the wild pear the original stock from which such great developments have been effected—is not by any means an everyday sight. Its fruit is small and its size much under the dimensions of the cultivated varieties whose name is legion.

Pyrus communis, a very near relation of the friendly Apple, grows naturally in a pyramidal form—at least so far as its head is concerned; but the branches have a curious and characteristic droop downwards after rising from the bole. There is an absence from them of the contorted, picturesque form of the Apple. Normal leaves are peculiarly smooth and shining, dark rich green in colour and symmetrically oval in shape, slightly pointed at their tops and slightly serrated, with venation consisting of a rather prominent midvein and wavy veinlets running between it and the leaf margin. The flowers are pure white, and are borne on corymbs, or little clusters, and the re-

sulting fruit is so well known that it need not be described—"pear-shape" being an expression so

Fig. 161—Leaf Spray of the Pear (*Pyrus communis*).

commonly used to indicate the forms of other things. The convexity at the base—in opposition

to the Apple which is always concave there—is a noticeable feature. Wild Pears are unfit to eat, being, what is called, austere in flavour ; but the flavour of the cultivated forms assumes various phases of deliciousness, all, however, possessing more or less the pear essence taste. The juiciness or mealiness of the garden sorts is a very various and uncertain "quality." The dark brown seeds are carefully enclosed in the "core," a horny five-celled receptacle, and the seeds are dark brown in colour. As with the Apple so with the Pear, many discriminating insects deposit their eggs in the fleshy body of the fruit; and the more delicious the juiciness and flavour the more it is likely to be attacked ; and after the caterpillar enclosed has made his hole for escape, he still lingers and is often discovered in a very lively condition when the Pear is cut open for eating,

The Pear Tree is not often found higher than about 50 feet, nor does it present a bole of very large dimensions ; but in gardens it will attain a height of 20 feet in ten years, giving an average rate of two feet of annual growth. It is generally found wild in dry soils, more frequently low down in valleys than on hillsides, and it lives to rather a respectable age, sometimes exceeding 400 years. It has a habit, common to many other Trees, of becoming more fruitful with advancing age. It is less destructive to grass in Pear orchards than the Apple, partly because the roots descend perpendicularly into the ground, but more especially on account of its pyramidal growth, which prevents its branches spreading, as Apple branches

Fig. 162—Bole of the Pear (*Pyrus communis*).

do, and shadowing the ground. It is extremely hardy and will generally pass unharmed through the severest winter.

Fig. 163—Winter Form of the Pear
(Pyrus communis).

Of its wood it may be said that it is fine grained, compact and strong. It is also heavy and slightly red in colour, but will readily stain black, and is

said to be so good an imitation of ebony that it does service for that famous wood, doubtless with much profit, on account of its greater abundance and consequent cheapness, to the fabricator of "ebony" products. It used to be employed by wood engravers in the days before process, but, of course, could not compete with the inimitable box for that purpose. It has the advantage of not warping or cracking, and has been used for a good many small purposes for which its solidity and colouring capacity make it available.

For preserves, as well as for dessert, the fruit is admirable, and the well-known, but not always obtainable, "perry," made from its fermented juice, was a great possession of old housewives, especially in the country. The production of "perry," however, is rather localised in certain parts of England, and there the method of manufacture is very much the same as for cider.

46.

PINE.

(*Pinus sylvestris.*)

ALMOST an infinity of interest centres around the simple word that heads this chapter. As we have already pointed out, to deal exhaustively with all that can be profitably said of the coniferous, or cone-bearing Trees, of which the Pines are the most important, would require several large volumes. But in such extended space there would be a considerable amount of detail that would not be particularly attractive to the general reader who wants to know something about our Trees. Sufficient for his purpose will probably be told him in this section of our volume: and the Trees, coming under the general heading of Pines dealt with here, are the principal ones to be found in Kew Gardens, so that those who may wish for further acquaintance with them will have no difficulty in accomplishing their desire.

The first we shall notice, the Scotch Pine or Scotch Fir, as it is often called, is perhaps the most interesting of them all, because of its association with our national history—for it is the

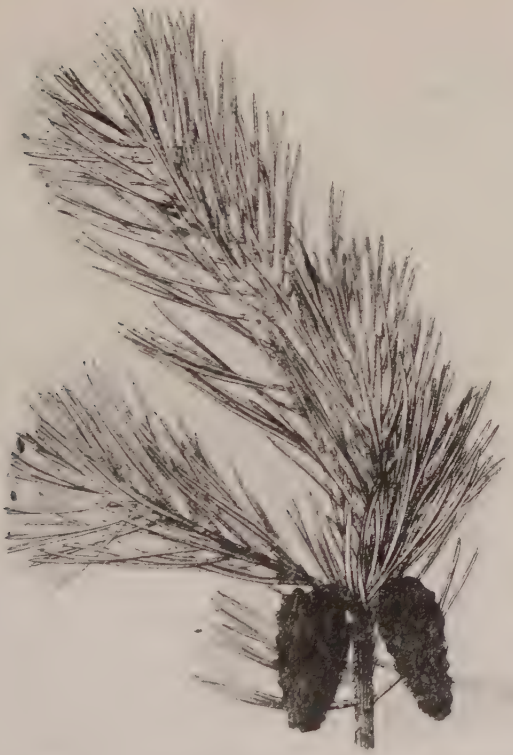


Fig. 164—Leaf Spray and unopened Cones of the Scotch Pine (*Pinus sylvestris*).

only one that is a "native;" but it is known in a good many places beyond our islands, and there

it is given quite an important catalogue of designations. The French call it *pin sauvage*, and also *pin d'ecosse* (as we do). The Germans, *gemeine fichte*, *kiefer*, *taune*, and fifty-five other names (Loudon avers). The Italians call it *pino sylvatico*, the Dutch, *pynboom*, the Spaniards, *pino sylvestre*, the Danes and Swedes, *fyrre*, and the Poles, Bohemians and Russians, *sosna*.

Under favourable conditions—the reverse of those to which the Japanese subject their remarkable pot-bound dwarfs—to which we have already alluded to in our "Preamble"—the Scotch Pine will reach a height of 100 feet and will produce a bole, even in this country, of four feet in diameter. There is a great tendency in this species, as in all the pines, to drop their lower branches, and the Kew Gardens one, of which we give an engraving, is shown in this denuded form. It is the crowding of pines, in the woods or forests in which they generally grow, that occasions this denudation of lower limbs; but very frequently the Scotch Pine can be seen when it has always grown apart from others in a grove—with most of its branches on; and then it presents the usual conical shape as illustrated by others that we figure—the Corsican and the Great Hooked Pine for instance—the branches showing almost down to the ground. There is great picturesqueness in the bole and bark of *Pinus sylvestris* owing to its reddish tinge and roughness. Loudon has an interesting note on this point confirmatory of what we have just stated. He says: "The trunk, where the Tree stands singly, is generally furnished with branches

Fig. 165 Leaf Spray and Opened Cone of the Scotch Pine.

from within a short distance of the ground to the summit; nevertheless in this, as in all the species of the Pine and Fir tribe, the lower branches

have a greater tendency to decay and fall off than in broad-leaved Trees. In like manner, when the Trees are grown in masses, the branches die off sooner, and so much so that no European broad-leaved Tree of equal girth of trunk is found clear of branches to so great a height as the wild Pine." An exception to this statement of our erudite author must be noted. The Stone Pine (*Pinus pinea*)—to be presently described—does not exhibit much tendency to cast its lower limbs, as upon a short trunk it throws out such a canopy of lateral branches that it has earned the name of the "Umbrella Pine." Loudon continues, with reference to *Pinus sylvestris*:—"The branches are disposed in whorls" (a circle set round an axis which, again, is an imaginary point forming a centre around which parts may be disposed) "from two to four together and sometimes five or six; they are at first slightly turned upwards, but, as the Tree advances in growth, they take a horizontal tendency and finally become somewhat pendent, with the exception of those branches which form the summit of the Tree. The leaves are in sheaths, spirally disposed on the branches; they are distinguishable at first sight from those of all other Pines in which the leaves are in pairs, by being much more glaucous," (from the latin *glaucus*, meaning bluish-grey or sea-green) "more especially when in a young state, and straighter. Those of *Pinus banksiana* and *Pinus inops* are also rather glaucous when young, but they are much shorter and more twisted. Those of *Pinus laricio* and *Pinus resinosa* can never be mistaken for those

Fig. 166—Bole of the Scotch Pine (*Pinus sylvestris*).

of *Pinus sylvestris*, from not being glaucous, and from their much greater length ; nor for those of

the section *Tæda* from there being three in a sheath. Examined more minutely the leaves of *Pinus sylvestris* will be found to have their two interior surfaces (which, while they are in the sheath, face each other) quite flat, or nearly concave, so as to form, before they expand or when they are pressed together, a cylinder of about half a line in diameter. The general length of leaves, in vigorous-growing Trees under 20 or 25 years' growth, is from two to three inches; but in old Trees they are much shorter: they are smooth on both surfaces, stiff, obtuse at both extremities, with a small point, and minutely serrated; dark green on the upper (that is flat, or concave) side, and glaucous and streaked on the other side, which is convex. They remain green on the Tree during four years, and generally drop off at the commencement of the fifth year. Long before this time, and generally at the beginning of the second year, they have entirely lost their light glaucous hue, and have become of the dark sombre appearance, which is characteristic of this Tree at every season, except that of summer, when the young glaucous shoots of the year give it a lighter hue."

The Scotch Pine generally flowers about May or June, and its inflorescence is catkins of two kinds. The male ones are about three-quarters of an inch in length and sometimes a little longer. They appear in whorls (already defined) at the ends of the branches of the year before, and at the base of the young shoots from which they actually spring. The yellow pollen of the

Fig. 167—Scotch Pine (*Pinus sylvestris*).

stamens in these catkins is very abundant, and gives at times quite a sulphureous aspect to the

Tree. The female flowers are the incipient cones and they generally appear in twos, but sometimes there are three or more, up to six together. They are of various colours—sometimes green, sometimes purple, and occasionally yellow or red. It generally takes eighteen months from the initial to the final ripening state, and then they become dark brown, and opening their sheaths liberate the tiny nut-like seeds.

The Scotch Pine produces "deal" of excellent quality and world-wide utility. By some authorities indeed its durability is said to equal that of the Oak, and on this point Dr. Smith in an essay on the production of timber, contributed to the Transactions of the Highland Society of Scotland, stated that he had seen some Scotch Pine wood, grown in the north Highlands, that when taken down after it had been 300 years in the roof of an old castle was as fresh and as full of resin as newly-imported timber, and that part of it was actually wrought up into new furniture.

To merely catalogue the ways of employing this wood would require a good deal of space; but it may be said that it eminently fulfils the thousand and one purposes for which deal serves, and, in addition, the Tree furnishes material, in its resinous products, whether these are exuded or extracted—for pitch, resin, tar and turpentine of first-rate quality, and it is almost an amusing fact that, as stated by one writer, the inner bark of young Scotch Pines in Norway has, when there has been a bad season for oats, been kiln-dried and mixed with oats for the making of oaten

Fig. 168 Leaves and Cones of the Corsican Pine *(Pinus laricio).*

bread, and Evelyn said that Pine chips had been used in the brewing of beer, as a substitute for hops.

The Corsican Pine (*Pinus laricio*), is sometimes called the Larch Pine, and is distinguished by its dark green—but not glaucous—foliage, the green being darker than that of any other of the Pines we are describing. In Corsica, from which its common name is derived, and where it grows extensively, specimens have been seen of the considerable height of 150 feet, but in this country it is seldom seen higher than 100 feet. Its branches are extended in the manner already defined in our remarks on the Scotch Pine. The bark is not unlike that of the last-named Tree, and is of a reddish tinge. By cracking in places it gives the trunk and branches a picturesque appearance. We give illustrations of bole, full tree, spray and cones, and these are much better than a detailed description; but it may be remarked that the leaves vary a good deal in length, which is influenced, not only by the age of the Tree the older the longer but by its position, and the soil on which it grows. Leaves of all Trees are more or less influenced by these conditions, and usually are larger or more developed in rich soil the variation in the case of *Pinus laricio* being from four to eight inches, an appreciable range of size. From the extremities of the shoots the inflorescence is produced in the form of catkins—the male ones being about an inch to an inch and a half long, and yellowish in colour, with an abundance of sulphur-coloured pollen, and the female catkins are oval or egg-shaped and reddish in colour. The latter, —forerunners of the seed-bearing cones—are

Fig. 169—Bole of the Corsican Pine (*Pinus laricio*).

produced on short stems, and have scales at their bases. A sort of blunt triangular point is

Fig. 170—Corsican Pine (*Pinus laricio*).

noticeable at the end of them, making the cone rather prickly to the touch. Ordinarily, the cones are produced in pairs, but sometimes there

are three or four together. Their direction from the stem is nearly horizontal, but they slightly point downwards. Their length is usually from two to three inches, and they are of a somewhat tawny colour, though occasionally with a greenish

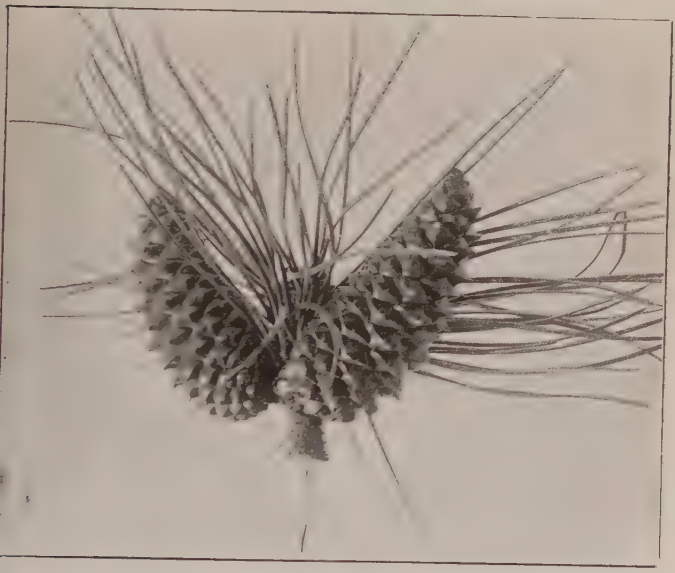


Fig. 171—Leaves and Cones of the Cluster-Coned Pine (*Pinus pinaster*).

or yellowish hue. They become ripe about November of the second year, from their first appearance—the initial stage. The seeds, of a greyish colour, are marked with small black spots.

Pinus laricio grows rather more rapidly than *sylvestris*, when under the same conditions. The Tree lives to about 80 years, and produces a very fine bole. Its timber is rather heavier than that of the Scotch Pine, but is not quite so brittle and it possesses the advantage of greater elasticity. Moreover, it contains more resin; but on all these points authorities differ, and it is always difficult to adjust the differences.

The Pinaster, or Cluster Pine, as it is alternatively called (*Pinus pinaster*), the last designation being in allusion to the fact that both its leaves and cones are clustered along the branches, is not so large a Tree as the two species last described, as it does not often grow beyond 60 feet high. Its bole, like the two Trees previously mentioned, gets furrowed and rough with age, but the general form of it is similar to the others, being of pyramidal shape, and its branches are produced in whorls, and have an upward tendency. It bears large catkins of male flowers, sometimes six inches in length, and of a purplish colour. The female catkins appear at the extremities of the young spring shoots, but their colour changes after a time to greenish, and finally assumes a beautiful and shiny brown colour when fully ripe in the autumn of the year following their appearance. This Tree grows wild in many parts of Europe and in Asia. Its wood is rather soft and therefore not so valuable as that of *sylvestris* and *laricio*; but it is employed for many purposes of the carpenter and is very productive of resin, lampblack and tar. It

Fig. 172—Bole of the Cluster-Coned Pine. *(Pinus pinaster).*

is not planted to a large extent in this country, as the ground it would occupy can be more profitably

Fig. 173—Bhotan Pine (*Pinus excelsa*).

devoted to the production of better kinds. As an ornamental Tree for parks and pleasure grounds it recommends itself by its handsome appearance,

Fig. 174. Leaf Spray of the Stone Pine (*Pinus pinea*).

and some good examples of it may be seen in the Royal Botanical Gardens at Kew. It will thrive on almost any sandy soil that is rather dry and of good depth; but it must not be planted in chalk.

The Bhotan Pine (*Pinus excelsa*) is sometimes, and very appropriately, called the Lofty Pine, as it rises to a height sometimes of 120 feet. Its rather bluish-green leaves are long and slender, its numerous branches are whorled, and its bark

Fig. 175—Cone of the Stone Pine (*Pinus pinea*).

is of a greyish colour. It produces an abundance of resin, but its wood is white. The cones hang down from the branches, and are long, smooth and cylindrical in shape—three or four generally growing together. The timber it produces is of

Fig. 176—Bole of the Stone Pine (*Pinus pinea*).

rather a good quality. A peculiarity in reference to the turpentine produced from it, is that it is so

liquid that it will pour out of the Tree on the slightest incision being made. As its branches

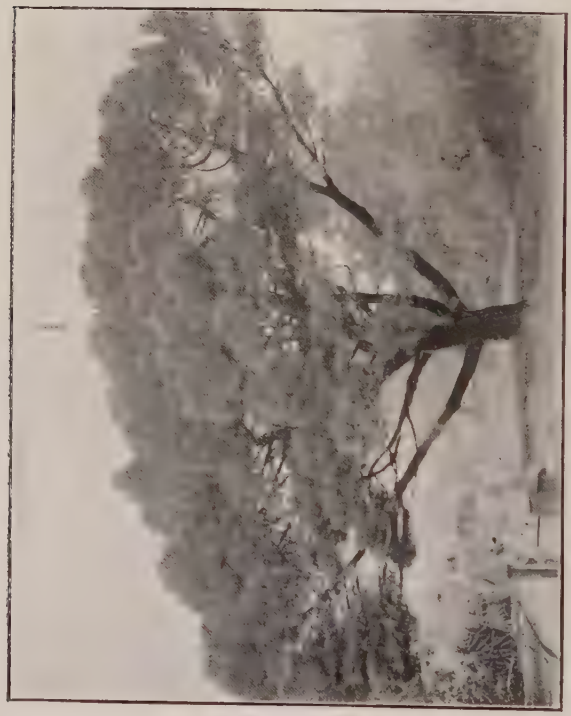


Fig. 177.—The Stone Pine (*Pinus pinea*).

sometimes droop it has been called "The Weeping Pine."

The Stone Pine (*Pinus pinea*) is often called "The Umbrella Pine" on account of the very noticeable form of its growth. There is a very picturesque specimen in Kew Gardens amongst

Fig. 178—The Stone Pine (*Pinus pinea*).

several of the species there, and of this particular one we give an engraving, as well as of another. The bark is reddish in colour, and the cones are very pretty, and of an egg

shape. The leaves are a deep dark green, and the bark, although much given to crack, is generally smooth. It produces yellowish catkins for its male inflorescence, but the female catkins are of a whitish hue. It takes, however, three years for the Stone Pine cones to open. In its native habitation it makes a height of trunk of sometimes as much as 60 feet. In this country it does not usually grow to a very large size; but the spread of its head in the form of a parasol or umbrella gives it a most striking and characteristic appearance. In olden times its seeds were preserved in honey and eaten, and it is recorded that some of this was found in the buried cities of Herculaneum and Pompeii. The Tree came to this country about the year 1548. Its picturesque appearance prompted Leigh Hunt to make the following poetical allusion to it -his description evidently referring to the Umbrella Pine. He was referring to the Stone Pines of Ravenna :—

"Various the Tree and passing foliage there,
Wild Pear and Oak and dusky Juniper,
With briony between in trails of white,
And Ivy and the suckle's steaky light,
And moss, warm gleaming with a sudden mark,
Like flings of sunshine left upon the bark,
And still the Pine, long-haired and dark and tall,
In lordly right, predominant o'er all.
Much they admire that old religious Tree
With shaft alone the rest upshooting free,
And shaking, when its dark locks feel the wind,
Its wealthy fruit with rough mosaic rind."

As in this country the Tree does not grow to a size to make its timber an important article of commerce, it does not find much employment here;

but on the Continent of Europe, especially in the South of France, and Italy, it is used for various purposes by the carpenter and joiner.

Fig. 179—Leaf Spray of the Jerusalem Pine (*Pinus halepensis*).

Our Pine chapter has already grown to some length, and therefore we must only briefly notice

one or two other species. And first let us take

The Aleppo Pine (*Pinus halepensis*), sometimes called the Jerusalem Pine, which has rather a short spreading head, and does not grow higher than 40 or 50 feet. It has a greyish or ash-coloured bark greenish, however, in the young branches. The leaves are deep green, about two or three inches in length, and as they do not remain so long on the Trees as those of some Pines, the branches sometimes look naked, when they have fallen off, and have not been renewed by others. They produce male catkins, which are reddish in colour, with short stems the female catkins appearing at the extremity of the shoots. They are greenish in hue, but sometimes tinged with red. The cones, rounded at the base and pointed at the apex, merge from a yellowish into a greyish tinge.

Pinus halepensis is at first a rapid grower, but its progress becomes more slow as it grows older. It was introduced into this country in 1683. It has wood of a fine grain, white when young, but darker in more mature Trees. This Tree also produces liquid resin in some quantity. It is more valued with us, however, for its ornamental than for its useful qualities.

The Great Prickly-coned Pine (*Pinus sabiniana*), is so called because the clusters of cones are accompanied by sharp points, which give them a prickly appearance. It grows sometimes to a height of 120 feet in its native country—California. It is upright and tapering in form, but it will be noticed that the Kew Gardens specimens do not assume much of this habit.

Fig. 180—Bole of the Jerusalem Pine (*Pinus halepensis*).

Loudon remarks that the largest and most handsome Trees of this species " inhabit the

aqueous vegetable deposits on the western flank of the Cordilleras of New Albion, at a great elevation above the level of the sea, and 1600 feet below the verge of perpetual snow, in the parallel of 40° north latitude or the less elevated mountains near the coast, where the temperature is higher, but more uniform in the parallel of 41° north. On decomposed granite schistus, or gravelly soils, the Trees are smaller and few, inhabiting the summits of the mountains only." *Pinus sabiniana* has wood that is rather soft and white and is not remarkable for its durability.

THE GREAT HOOKED PINE, or Coulter's Pine (*Pinus coulteri*), of which we give an engraving from a Kew Gardens specimen, is a very vigorous Tree that grows to as much as a hundred feet high. It has a bold, fine appearance with a handsome spreading head and knotted branches, from which, probably, its common name is derived. It produces very large cones, sometimes a foot in length, of a shape that would be described as oblong conical, and they are as wide, sometimes, as 6 inches. One cone has been known to weigh four pounds. Dr. Coulter was the discoverer of this species—which botanically is called after him—about the year 1832, so that it has not been in this country a very long time. In reference to the distinction of this species and *Pinus sabiniana*, just noticed, Loudon has an important note. He says: "In its general appearance, it" (the Great Hooked Pine) "resembles *Pinus sabiniana*; but it is readily distinguished from that species by the upright character of its foliage. Both species

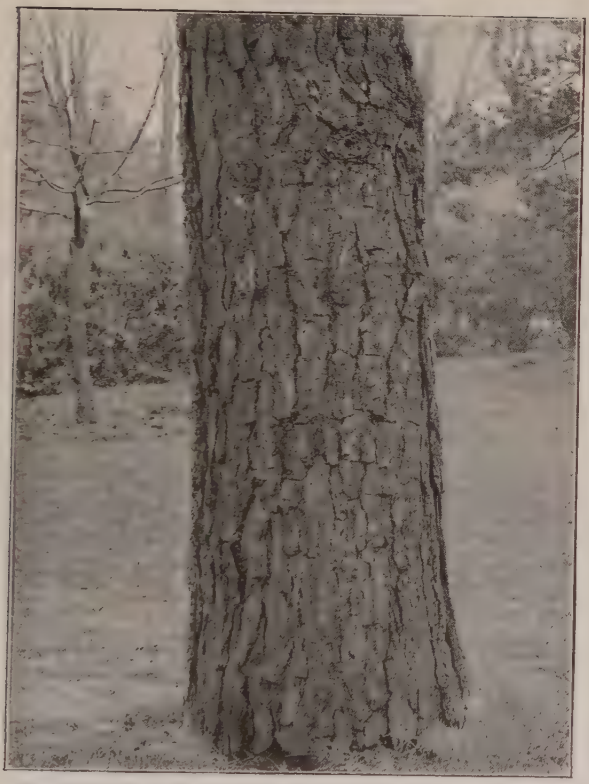


Fig. 181—Bole of the Great Prickly-Coned Pine (*Pinus sabiniana*).

have the buds of the same form and colour; the leaves of the same beautiful glaucous hue in

Fig. 182 -Bole of the Great Hooked Pine *(Pinus coulteri).*

every stage of their growth; the young shoots covered with a violet glaucous bloom like those of *Pinus inops* and *Pinus mitis*, and both retain

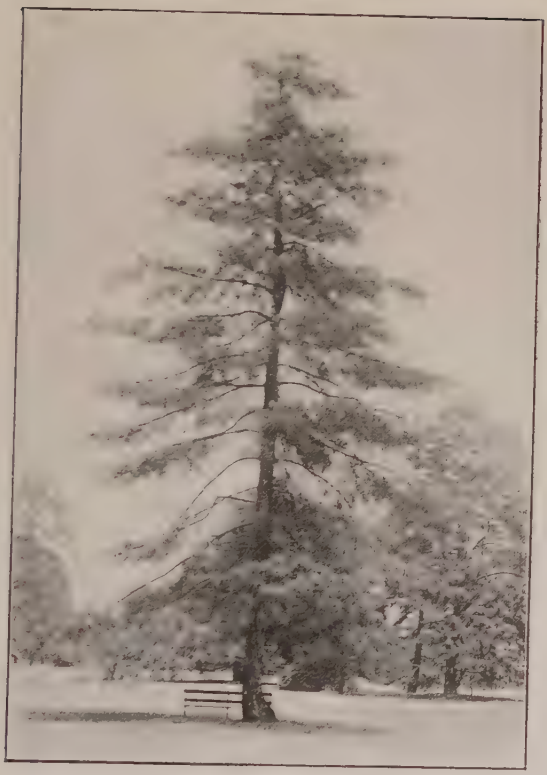


Fig. 183—The Great Hooked Pine
(*Pinus coulteri.*)

their leaves till the summer of the third year. The colour and form of the seeds in the two

kinds are exactly the same; but the larger cone has the smaller seeds. To us, it appears that they are only varieties of one species; but, if they are so, they are as well worth keep-

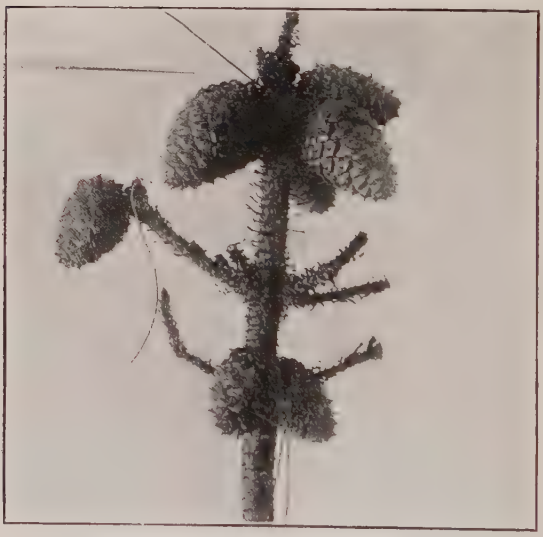


Fig. 184—Cones of the smaller Prickly-Coned Pine (*Pinus muricata*).

ing distinct as any species whatever. They may, indeed, be described as of surpassing beauty; and, what adds greatly to their value, they appear to be quite hardy."

THE SMALLER PRICKLY-CONED PINE (*Pinus muricata*) is a Tree of remarkable appearance, but it only grows to a height of about 40 feet. A specimen will be found at the end of the lake at Kew Gardens, where it assumes an almost weird appearance. Its picturesque-looking cones grow in clusters and have the peculiarity of remaining many years on the branches. It is a native of California, where it obtains the curious name of "The Bishop." In that country it is found at a height of 3000 feet above sea level.

The last Tree but one of the genus *Pinus* to be mentioned in this chapter is THE GIGANTIC, OR LAMBERT'S PINE (*Pinus lambertiana*), for it grows to a height of 200 feet, and produces long cylindrical cones of the unusual length of 16 to 18 inches and four inches wide in their broadest part. One Tree that had been blown down was, according to Douglas, 215 feet in length, 57 feet 9 inches in girth at 3 feet from the ground, and even at 134 feet from the ground 17 feet 5 inches in circumference a truly enormous Tree. It has a very straight trunk, but loses its side branches usually for a considerable distance from the ground -a circumstance that gives it a remarkable appearance. It has a very smooth bark which is light brown in colour. The branches droop and form, towards the top, an impressive head. Mention has already been made of the exceptionally large cones of *Pinus lambertiana*. It is sometimes called the Sugar Pine because the resin which exudes from it, when the Tree has been

Fig. 185—Bole of the Sugar Pine (*Pinus lambertiana*).

partly burnt, acquires a sweet taste. In fact, it is used by the natives of the country in which it

grows wild, the Rocky Mountains, as sugar, and is mixed with their food. The seeds, too, are roasted and eaten and made into coarse cakes for winter consumption.

Fig. 186—Leaves of the Chilian Pine (*Pinus araucaria*).

Although included amongst the order of coniferous Trees, The Araucaria (*Pinus araucaria* and also *Araucaria imbricata*), popularly called The Monkey Puzzle, is not a Pine according to

Fig. 187 -The Chilian Pine (*Pinus araucaria*).

some botanists, although it is popularly described as "The Chilian Pine." Instead of allowing it to

stand in a genus all by itself we shall introduce a brief mention of it here with engravings. It is well known as a frequent ornament of garden and park, and it has well earned, what may be called, its *sobriquet* of "Monkey Puzzle," because it is certain that even the clever animal, that has lent its name to it, would find great difficulty in climbing it, so "fierce"—if the expression may be allowed—are its sharp and spiny leaves. It produces nearly globular cones at the extreme ends of the branches, and it has a double bark from which flows a great abundance of resin. Curiously enough in its native countries—South America, Polynesia and Australia—whilst the female Tree grows to a height of 150 feet, the male Tree only rises to about 40 or 50 feet—it being understood from this circumstance that it is diœcious—male and female blossoms being produced on different Trees. The seeds in the cones are large, often more than an inch long. Its wood is usually white, but sometimes a bright yellow in the centre of the stem. It is hard, solid, full of beautiful veins, is easily polished, and is valuable for many purposes. It is said that the smell of the resin, which flows out as a milky-looking juice when the bark is scratched, has medicinal value and cures the most violent rheumatic headaches when applied direct to the seat of pain.

47.

PLANE.

(*Platanus orientalis.*)

IT is rather curious and interesting to note in these modern days of boulevards, and Tree "revivals"—if the expression may be

Fig. 188—Leaf of the Oriental Plane (*Platanus orientalis*).

allowed when the inhabitants of our modern cities recognise more they ever did before the

importance of having Trees in their midst—that the species we are now about to discuss were extremely popular with the Romans and the Greeks. The Romans were especially fond of the Plane, which they freely used for the ornamentation of their public places. Evelyn says: "These Trees the Romans first brought out of the Levant, and cultivated with so much industry and cost, for their stately and proud heads only, that the great orators and statesmen, Cicero and Hortensius, would exchange now and then a turn at the bar, that they might have the pleasure to step to their villas and refresh their platans, which they could often irrigate with wine instead of water." Pliny had a good deal to say about the Tree. He remarked: "Much has been said of the Plane Trees in the Lyceum at Athens, of which the roots extended even further than the branches. There is now in Lycia a famous Plane Tree, on the public road, near a very cold fountain. This Tree is in itself a forest; its branches are as large and thick as Trees, and they cover an immense extent of ground with their shade. The trunk of this Tree is 81 feet in circumference, is hollow, and has, inside, numerous stones, covered with moss. The Tree was such a favourite with Licinius Mucianus, three times Governor of the Province of Lucia, that he thought it worth while to hand down to posterity, that he had eaten in this hollow Tree or grotto, with 18 persons, who had for couches or cushions, to recline on, only the leaves of the Tree; that the thickness of the foliage sheltered them from a heavy shower of

rain ; and that he (the Governor) enjoyed more pleasure, during his repast in this Tree, than he

Fig. 189 Leaf Spray of the Oriental Plane (*Platanus orientalis*).

had ever done in his most magnificent marble saloon."

There are very numerous historical references to the beauty and magnificence and popularity of Plane Trees; but we can only find space to refer to one other instance, which has reference to the particular Tree which is the subject of the first notice in this chapter; and for this we quote from delightfully quaint old Gilpin, who in "Forest Scenery" says:—"One of the most celebrated Trees in ancient record was an oriental Plane, which grew in Phrygia. Its dimensions are not handed down to us; but from the following circumstances we may suppose them to have been very ample. When Xerxes set out on his Grecian expedition his route led him near this noble Tree. Xerxes, it seems was a great admirer of Trees. Amidst all his devastations in an enemy's country it was his particular order to spare the groves. This wonderful Plane, therefore, struck his fancy. He had seen nothing like it before, and, to the astonishment of all his officers, orders were dispatched to the right and left of his mighty host to halt three days, during which time he could not be drawn from the Phrygian Plane. His pavilion was spread under it, and he enjoyed the luxury of its delicious shade, while the Greeks were taking measures to defend Thermopylæ." Gilpin drily adds:—"The story may not speak much in favour of the Prince; but it is my business only to pay honour to the Tree."

This remarkable and interesting Tree, so useful for town planting, because it can withstand better than most other Trees the smoke-polluted atmosphere of crowded manufacturing districts, was

Fig. 190—Bole of the Oriental Plane (*Platanus orientalis*).

introduced into this country about the year 1541, and there are some very good specimens in Kew Gardens, one especially, the subject of our illustration, being a very handsome Tree. The bark is smooth, and, in colour, very noticeable—a greyish-white or whiteish-grey. It has, like the other species we shall presently refer to, the peculiar habit of shedding its bark in large patches, as new bark is formed underneath; and that is believed to be one reason why it can withstand smoke, as the smoke-impregnated bark is discarded. There is no doubt, we think, that Trees do, to a certain modified extent, breathe through their bark—especially when it is newly-formed and young—as they do through the stomata in their leaves. The leaves of a Tree get choked with smoke and dust—so very plentiful in towns; but the rain washes them more effectually than it can the trunks and branches.

The flowers of the Plane appear in the form of globular catkins, which are very conspicuous. Each separate flower is very small, and the catkins vary in size; but they can be very readily seen as they appear before the foliage. They ripen into seed on the balls, which hang down in little bunches, on rather long stems. Usually the seed is ripe toward the end of autumn.

Platanus orientalis, is a very rapid grower, and it is believed to live to a very great age. It reaches a height of 70 feet, sometimes in the short period of 30 years. For the reason stated, the wood is not considered very valuable, although it is utilised for various kinds of cabinet work. Boats, or

Fig. 191—Winter Form of the Oriental Plane (*Platanus orientalis*).

rather canoes, have been made of the hollowed trunks.

The London Plane (*Planatus acerifolia*), is very similar to the Oriental Plane, both in its habit of growth, its bark-peeling tendency, and

Fig. 192.—Leaf of the London Plane (*Platanus acerifolia*).

its foliage and flowers, but it does not usually grow to so large a size. The timber is different in colour, having usually a reddish tinge. The foliage

is of the same general character. It is, in both Trees, very beautiful, and usually of a golden-green colour, but is less distinctly palmated than that of the Oriental Plane. The latter Tree is more

Fig. 193—Leaf Spray of the London Plane (*Platanus acerifolia*).

spreading in its character. Both Trees are fond of a moist situation, and thrive exceedingly well, when planted near water. The specific name of *acerifolia* is given to it because its leaves are not

unlike those of the Maple, *Acer campestre*, and probably the common name of London Plane is of comparatively recent adoption, on account

Fig. 194.—Naked Spray of the Plane.

of the large number of this species to be found growing and thriving in the Metropolis.

Fig. 195—Bole of the Western (or London) Plane (*Platanus acerifolia*).

Fig. 196—Winter Form of the Western (or London) Plane (*Platanus acerifolia*).

48.

POPLAR.

(*Populus alba.*)

THE interesting and really delightful group of Trees which it is now our pleasure to discuss have a common name which is doubtless derived from their character. There have been several suggestions as to the origin of the name and they are all interesting. One is that the botanical generic name of *Populus* is derived from the word *paltō* or *paipallō*, to vibrate or shake in allusion to the perpetually quivering leaves of all the species when the slightest breath of wind is blowing. Another explanation is that in ancient Rome the Tree was so much used for the adornment of public places that it was called *arbor populi*, or the Tree of the people. That seems a not unlikely origin. One writer says that it was called after "the people," not because it was planted in public thoroughfares, but on account of its leaves being easily agitated like the people. It is also possible that the latin word *palpito*, to move quickly up and down—which is exactly the motion of the Poplar leaves - and to tremble or palpitate, originated the name, apart

from any reference to popular agitation. But in any case, in our own day, the Tree is a popular

Fig. 197.—Leaf of the White Poplar (*Populus alba*).

favourite, and the very embodiment of activity and cheerfulness, especially when its glossy leaves are dancing in the sun on some river bank.

There is an especial brightness in the first Tree we shall notice of the group—The White Poplar,

Fig. 198—Naked Spray of the Poplar.

Populus alba. Vigorousness as well as rapidity of growth are especial characteristics of this species ;

Fig. 199—Leaf Spray of the White Poplar (*Populus alba*).

but a peculiarity of it is that leaves on the same Tree vary a good deal in form, being sometimes so deeply lobed as to become palmate. The nor-

mal form, of which we give an illustration in our leaf spray, will be observed in general in the earliest leaves of spring. But, as the season advances, and the young shoots acquire increased vigour, their leaves become developed, sometimes to more than double the size of the earlier leaves, and this development extends naturally to the indentations between the blunt-pointed lobes. The snowy whiteness of the downy undersides of the leaves and of the young branches is another conspicuous and distinguishing feature in this species, giving, as it does, an extremely white appearance to the whole of the foliage when it is stirred by the wind, and contrasting with the dark green hue of the smooth and shining surfaces of the upper sides of the leaves. The female catkins, on which the inflorescence is borne, are oval in shape and dark brown in colour; but it is the male catkins which are most prominently noticeable, as they appear very abundantly in advance of the leaves and are dark red in colour, and when, having performed their office of shedding their pollen, they drop from the Tree, the ground is often strewn with quite a carpet of them.

The wood of all the Poplars is soft and light, and not very durable, that is when subject to exposure to the weather; but when used inside buildings or for any purpose where it is kept dry, it is rather remarkable for its durability. An inscription was once put on a Poplar plank that is believed to have some truth in it. It ran :—

"Though heart of Oak be e'er so stout
Keep me dry and I'll see him out."

Fig. 200.—Winter Form of the White Poplar (*Populus alba*).

The White Poplar is sometimes called the Abele Poplar, a name believed to be derived from the

city of Arbela, in the plains of Nineveh, in the neighbourhood of which this Tree grew in great quantities. It grows to a height of as much, sometimes, as 100 feet, when growing in its

Fig. 201—Leaf of the Grey Poplar (*Populus canescens*).

favourite positions near water, and some of the finest Trees of this species in this country are seen on the banks of our rivers.

THE GREY POPLAR (*Populus canescens*) is very much like its white-leaved congener in some re-

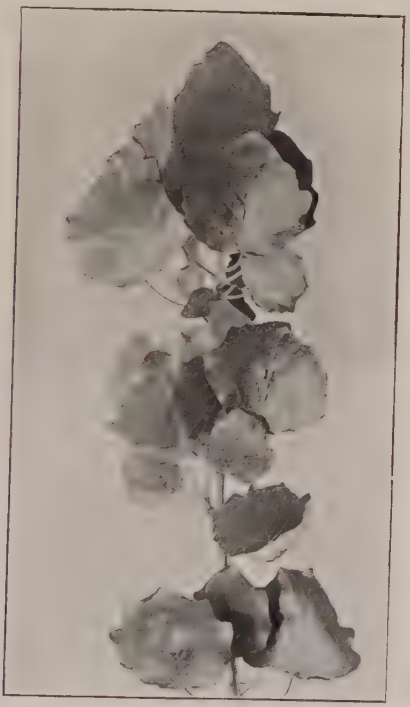


Fig. 202—LEAF SPRAY OF THE GREY POPLAR (*Populus canescens*).

spects; but the down on the undersides of the leaves is more grey than white and hence its com-

Fig. 203.—Bole of the Grey Poplar (*Populus canescens*)

mon name. What distinguishes it principally from *Populus alba* is the fact that the stigmas, or male

Fig. 204—Winter Form of the Grey Poplar (*Populus canescens*).

organs, of the inflorescence are eight in number, whereas in the White Poplar there are only four

stigmas. The leaves also are rounder and less palmate, and the branches more upright and compact, whereas in *Populus alba* the branches spread a good deal. It grows more slowly than the White Poplar, although it commonly makes a

Fig. 205—Leaf of the Black Poplar (*Populus nigra*).

Tree of about the same height. Its timber is superior in the matter of firmness to any others of the same genus in this country; and it has the advantage, in common with its botanical relations, of being difficult to burn. Whilst, therefore, it

does not make good fuel, it is safer for any building purpose.

This species, *Populus alba*, and the one to be next noticed in this chapter, are all natives of Britain, and they are natives also of France and Germany, where, to a large extent, they are used to form wayside groves. Anyone, taking the familiar route through both these countries involved in "going up the Rhine," will have noticed the large number of Poplars he sees along the railway routes. Many articles, in which extreme lightness, combined with a certain degree of toughness and elasticity are essential, are manufactured from Poplar wood. The rollers used by drapers, and the boxes required for their trade, are examples of the use to which it is put; whilst its inflammability is also a great recommendation.

The Black Poplar (*Populus nigra*) grows to a height of from 50 to 100 feet, and has a somewhat spreading head. Like all the Trees of the genus, it is rather a shallow-rooter, but it goes deeper down into the soil than its congeners. Its leaves are rather a dark green, and are smooth and glossy, but wanting in the downiness that gives an especial character, as well as a name, to *Populus alba*. The leaves are slightly serrated and very pretty, and their continual motion makes them pre-eminently cheerful and bright. Its inflorescence is of the regular poplar character, and is produced on catkins, which are not quite so long as those of either *alba* or *tremula* (the Aspen). As with the other species of the genus, they come out abundantly before the leaves, and

being of a striking red colour they make a very noticeable litter on the ground. The female catkins are round in shape, and the succeeding fruit—the seed is wrapped in a white cottony substance.

Fig. 206—Leaf of the Lombardy Poplar (*Populus nigra pyramidalis*).

Like its relations, the Black Poplar is a rapid grower, but thrives best in damp positions that are near streams. The timber is yellow and soft ;

and though it splits readily, it does not splinter, and is utilised for very much the same purposes as that of the other species of the genus. It is,

Fig. 207—Leaf Spray of the Black Poplar (*Populus nigra*).

however, preferred for the greater ease with which it can be worked. White wood vessels employed for domestic purposes such as bread

Fig. 208—Bole of the Black Poplar (*Populus nigra*).

trays, bowls, clogs and sabots, are made of Black Poplar wood. The young shoots of this

Fig. 209—Winter Form of the Black Poplar (*Populus nigra*).

Tree are employed, owing to a certain elasticity, for the same purposes as Willow twigs, namely,

for baskets of different kinds. If the Trees are pollarded they are more productive of young shoots. Even the woolly substance surrounding the seeds has been employed as a substitute for wadding.

The Lombardy Poplar (*populus nigra pyramidalis*), although enjoying a long and rather formidable botanical name, is an eminently popular and well-known Tree, furnishing a landmark that can be seen for a long distance away. It makes itself known, in fact, by its pyramidal form, which is a remarkably bold, upright, and striking one. It has absolutely no horizontal branches, as they are all turned upwards. Loudon treats it as a separate species from *Populus nigra*, which it resembles in practically everything but the form of its growth, and he calls it *Populus fastigiata*, the specific name being from the latin *fastigiatus*, meaning parallel parts pointing upwards, but the authorities at Kew Gardens treat it as we do, as merely a variety of the Black Poplar. The points of difference are too small to warrant its being ranked as a distinct species, and there is too much tendency amongst many botanists, towards species-making. One of the small differences between *pyramidalis* and the normal form, is the earlier production of leaves in the last named. It derives its most generally recognised common name, from the fact that it is abundant in Lombardy, from which it was introduced into this country about the year 1758; and it has so generally acclimatised itself since then, that it is

to be found in almost every part of these islands, and on the continent of Europe it has been

Fig. 210.—Leaf Spray of the Lombardy Poplar (*Populus nigra pyramidalis*).

planted in a vast number of places—particularly along public roads.

Fig. 211—Bole of the Lombardy Poplar (*Populus nigra pyramidalis*).

The Lombardy Poplar had not been long in this country, when Gilpin wrote his "Forest Scenery," and although, with us, our present subject is in no way connected with the scenery of

our forests, Gilpin's remarks are so interesting that we will quote them. He says:—"Within these last few years the Lombardy Poplar, which graces the banks of the Po, has been much introduced in English plantations. It seems to like a British soil, and its youth is promising; but I have never seen it in full maturity. Its conic form, as a deciduous tree, is peculiar. Among evergreens, we find the same character in the Cypress; and both Trees, in many situations, have a good effect. The Cypress often, amid the ruins of ancient Rome, breaks the regularity of a wall or a pediment, by its conic form: and the Poplar, on the banks of the Po, no doubt has the same effect among its deciduous brethren, by forming the apex of a clump; though I have been told that, in its age, it loses its shape and spreads more into a head. The oldest poplars of this kind I have seen, are at Blenheim. They are not old trees, but are very tall and, I believe, still preserve their spiry form. One beauty the Italian Poplar possesses, which is almost peculiar to itself; and that is the waving line it forms when agitated by the wind. Most trees in this circumstance, are partially agitated; one side is at rest, while the other is in motion. But the Italian Poplar waves in one simple sweep from the top to the bottom, like an ostrich feather on a lady's head. All the branches coincide in the motion: but, in painting, I know not that I should represent any kind of motion in a Tree, except that of a violent storm. When the blast continues for some time, when the black heavens

Fig. 212—Bole of the Lombardy Poplar (*Populus nigra pyramidalis*).

are in unison with it, and help to tell the story, an Oak straining in the wind is an object of picturesque beauty ; but when the gentle breeze,

Fig. 213—Winter Form of the Lombardy Poplar *(Populus nigra pyramidalis).*

pressing upon the quivering Poplar, bends it only in easy motion, whilst a serene sky indicates the heavens to be at peace, there is nothing to act in concert with the motion of the Tree ; it seems

to have taken its form from the influence of a sea air, or some other malign impression; and exhibiting an unnatural appearance, disgusts. One thing more I should mention with regard to the Italian Poplar; which is that, although it sometimes has a good effect when standing singly, it generally has a better when two or three are planted in a clump."

Leigh Hunt, referred to this Tree when he wrote:

"The Poplar's shoot,
Which, like a feather, waves from head to foot."

The Aspen, or Trembling-leaved Poplar (*Populus tremula*), is the last but by no means the least interesting of the subjects of this Chapter. Some years ago the present writer published a little study of the Aspen, and as perhaps, there is not much to add to it, he may be allowed to quote his description: "Quivering, even in the sultry, breezeless days of summer, the leaves of the Aspen have lent to this Tree a charm unpossessed, in the same degree, by any other of the inhabitants of our woodlands. And how strangely does this motion touch us with a gentle sense of pleasure! How beautifully suggestive it is, when all else is still, of the *life* of nature! The peculiar tremulousness of the Aspen leaves is owing to their exceptional smallness, to the slenderness of their stalks, and to the exceptional thinness of the depressed upper portion of the stalk—characters which are not so prominent in the leaves of the other species of Poplar. In their general form, and in the waviness and general character of the indentations on their

margins, the leaves of *Populus tremula* resemble those of the Grey Poplar. But they are smaller and, usually, rounder ; and although they are slightly downy on their under sides, when they are young, they afterwards become smooth on both sides—being of a dark, shining green on their upper surfaces. Though a rapid grower, and a large Tree, *Tremula* does not usually attain the size of *Alba*, rarely exceeding 50 feet in height. It has a straight stem, and when young—and until it becomes cracked by age—smooth bark. Its catkins are cylindrical and pendulous, each flower in the male catkins containing four erect stigmas. The flowers are brown in colour, and the autumnal leaves also turn to a dark brown colour, sometimes being almost black. Though the Aspen does not, quite so readily, grow from cuttings as the other species of Poplar which have been described, it throws up, from its surface-roots, suckers in sufficient abundance to admit of extensive culture."

Beavers, cows, deer, goats, sheep, and some other animals are fonder, it is said, of Aspen leaves than of any other Tree leaves whatsoever. The wood can be put to a number of uses, although it is white and soft, and it is employed for cask staves, milk pails, clogs, butcher's trays, sabots, bars, pins, laths, ladder "rounds," and various other minor purposes. It is also employed in buildings as under-pinnings for floors, &c. The bark is useful in tanning. Decoctions of the bark have been used as medicine, both for men and horses.

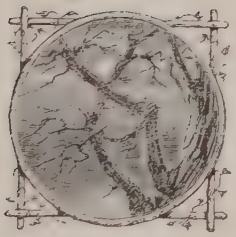
Fig. 214—Leaf Spray of the Aspen (*Populus tremula*).

Naturally our poets have been attracted by the present interesting subject. Spenser wrote ;

"His hand did quake
And tremble like a leaf of Aspen green."

But the best known reference, perhaps, is in the oft-quoted lines of Sir Walter Scott :—

"Oh Woman! in our hours of ease
Uncertain, coy, and hard to please,
And variable as the shade
By the light quivering Aspen made,
When pain or anguish wring the brow,
A ministering angel thou."



49

QUINCE.

(*Cydonia vulgaris.*)

AN unpretending but interesting Tree is the Quince, not often attaining a height of more than 20 feet. Its twisted trunk and rather tortuous branches are somewhat suggestive of the Apple, and indeed some botanists include it in the same genus *Pyrus* as that of our more common friend, whose fruit is probably the most universally known. The generic name of *Cydonia* is derived from the place of its nativity, Cydon, in Canada (or in our Island it is not a native, but merely a settler. The Tree has smooth bark, brown in colour. The leaves are very pretty, and are especially noticeable in the autumn by the beauty and variety of their colouring. In size the leaves vary a good deal. Their shape is oval, slightly pointed at the apex, and very elegantly veined. Indeed the system of venation is elaborate. From the central and somewhat rigid midvein, a number of prominent branches are given off irregularly on each side, and are two or three times forked near the margins. Across these branch veins, taking a

wavy course, run a series of veinlets, between the lines of which there is a close reticulation of venules. The autumn colouring of the foliage

Fig. 215 Leaf Spray of the Quince (*Cydonia vulgaris*).

is worthy of especial notice. On the same Tree one may pick deep green leaves, bright yellow, deep orange, golden green, golden brown, and

red, inclining to black, leaves; green leaves, with golden or orange veins; golden green, with orange and blackish red; green and dark brown, with orange and dark red; green and orange with light red veins, and many other markings and shades between all these—the mass of colour on the whole of a Tree in the early season of autumn being frequently very striking.

The flowers of *Cydonia vulgaris* are rather large, with pale red or white petals; and the fruit is large, handsome, globular in shape, or what would more accurately be described as a roundish pear-shape. Its colour is a beautiful orange and is rather suggestive of the ripe lemon. It has a not very agreeable perfume, something like that of the apple, but wanting in the apple sweetness. The Tree is a fairly rapid grower, and is much appreciated for ornamentation in gardens and shrubberies. The Romans and Greeks are believed to have held the Quince in great estimation. Pliny refers to the conspicuous fruitfulness of the Tree, and mentions its boughs as being often bent to the ground with the weight of fruit. He mentions, also, that ripe Quinces were employed to decorate the images of the Gods.

As to the uses of the Tree, the wood is, from the usually small size of the Trees, too unimportant to find much employment by the turner and carpenter, but the fruit, although it is too unpleasant in taste to be eaten by itself, is made into preserves, such as marmalade, and, mixed with apples, gives a certain appreciable flavour to

tarts. A wine called Quince Wine, is also manufactured from the fruit. The Quinces are first pounded into a pulp, mixed with sugar and water, and then fermented—the process being in fact, similar to that adopted in making other fruit wines. Quinces also have a medicinal value and are astringent.

It may be noted, in conclusion, that the ancients looked upon the Quince as the emblem of fruitfulness, happiness and love. Nuptual chambers were decorated with its fruit, and it was customary for the bride and bridegroom to partake of it directly they were married—a custom that might be followed with advantage in our own days, if the result were to give an incentive to a married life of peace and happiness.

50.

ROSE.

(*Rosa canina*).

It is rather curious that, although everybody looks upon the charming subject of our present chapter as a small or large shrub, horticulturists invariably refer to it as a Tree. So many "rose Trees" would be the phraseology adopted in a catalogue. In any case, of all our wild roses, *Rosa canina*—the common dog-rose, is the largest, the most common, and the most familiar to everybody who wanders into any country place. That it is a native of this country admits of no question, and a considerable number of species and varieties are included by so jealous an excluder of anything exotic as Sir J. D. Hooker, in his British "Flora." The name is really legion; but whilst it is only our intention to deal, in this chapter, with the beautiful and delightful subject which heads it, there is no doubt of its wonderful aptitude for producing crowds of interesting "departures" from its normal form. On the general subject, Loudon has an important note. He says:—"The genus *Rosa* is in a state of confusion still greater than that which subsists

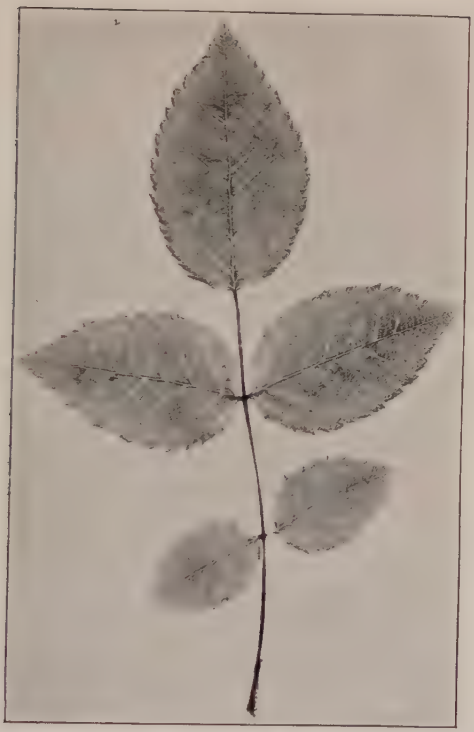


Fig. 216—Leaf Spray of a Cultivated Rose.

among the different kinds of *Rubus*; nor can it well be otherwise, when we consider that the greater number of kinds in cultivation are garden

productions, and that the wild kinds differ exceedingly according to soil and situation, and have been chiefly described by botanists from dried specimens. In general, if the reader considers the plant at the head of each section in our arrangement as a species, and all the others as varieties or races; or, perhaps, as sub-species, or hybrids, which have originated between it and some other section, he will err on the safe side. 'Nature,' it is observed in the *Nouveau du Hamel*, 'appears scarcely to have placed any limit between the different species of the Rose; and if it is already very difficult to define the wild species, which have not yet been modified by culture, it is almost impossible to refer to their original type, the numerous varieties which culture has made in the flowers of species already so nearly resembling each other.'"

A big volume would not exhaust all that can be said about the rose; nor need we describe in reference to the beautiful wild rose what is so familiar to everybody its charmingly-beautiful leaves, its delightful and conspicuous blossoms, and its brilliantly red fruit. And it is scarcely necessary to mention that an excellent conserve can be made from the pulp of the berries, and that perhaps, the most delicious perfume in nature can be extracted from its scented varieties. But we present one leaf, absolutely nature printed, from a garden variety, to show the exquisitely-beautiful arrangement of the veining, and a "spray" of the leaves of the normal wilding *Rosa canina*.

But one further note we must add, in proof of the poet's estimation of an unrivalled plant. It is from Moore's *Anacreon*—the birth of the Rose

Fig. 217.—Leaf Spray and Blossom of the Wild Rose (*Rosa canina*).

being assumed to be coeval with the births of Venus and Minerva:—

"Then, then, in strange eventful hour,
The earth produced an infant flower,
Which sprang with blushing tinctures drest,
And wanton'd o'er its parent breast.
The gods beheld this brilliant birth,
And hail'd the Rose—the boon of earth,"

51.

SEQUOIA.

(Sequoia sempervirens).

OUR Trees, whether native or introduced, respond to their natural, or extemporised, "conditions of growth," and we cannot make them for size compete with the mammoths of the American forests. "Big Trees," with us, have mostly reached their maximum height at 150 feet, and are little more than pigmies when compared with the arboreal giants of the Californian forests, for instance. There, a height of 430 or 450 feet is no very unusual production! Yet it is interesting to look at what we may call a "tame" Sequoia (such as that of which we give a bole engraving) in Kew Gardens and reflect on its possibilities in its native regions. Advertisements of certain Californian wines have, for notoriety, been accompanied by illustrations of big boles in order to enable them to be called "big tree" brands; and these illustrations exhibit a trunk ten yards in diameter pierced midway by a cutting large enough for a pair of horses and a waggon to drive through—in order to give a comparative idea of size.

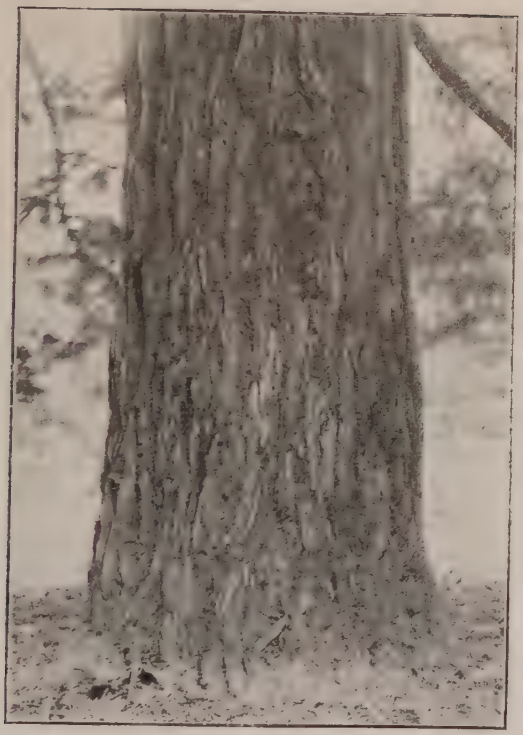


Fig. 218—Bole of the Sequoia (*Sequoia sempervirens*)

The two species of *Sequoia*—the one whose name heads this chapter and the *Sequoia gigantea* (also known as the *Wellingtonia gigantea*) are

about the biggest growing trees in the World—*Sequoia gigantea* making a trunk of the huge dimensions just indicated. One specimen in the King's River Forest is 35 feet in diameter inside the bark, and is believed to be more than 4,000 years old! For size and height *Eucalyptus* Trees run the *Sequoia* genus pretty hard, so to speak. In 1882 Mr. A. G. Guillemard, contributor to *Forestry*, then edited by the present writer, described a *Eucalyptus* of enormous dimensions. Speaking of Australian "Big Trees," he said: - "But Victoria now claims the glory of owning the biggest of all the living 'big trees' in the World so far as height is concerned. In the Dandenong district at Fernshaw has recently been discovered a specimen of *Eucalyptus amygdalina*, or Almond-leaf Gum, which has been accurately measured as reaching the enormous height of 380 feet before throwing out a single branch, and 430 feet to the top, and having a girth of 60 feet at some distance from the ground. Some idea of what a height of 430 feet represents may be gained from the fact that this gum tree, if growing by the side of the Houses of Parliament at Westminster, would overtop the clock tower by exactly 100 feet." Mr. Guillemard added that his statistics of Australian big trees "led to the conclusion that though the *Sequoia* is still rightly considered the 'big tree' of the World in point of girth, it is surpassed in height by the giant *Eucalyptus* of the Australian forests."

The Red Wood, as the subject of this chapter—*Sequoia sempervirens*—is popularly called, is the

most valuable of Californian timber trees. It is found most abundantly to the north of San Francisco in positions where its growth is doubtless aided—on mountain ranges of the foggy sea coast—by a moist atmosphere. Its ordinary height ranges between 200 and 300 feet, and it has a straight cylindrical trunk which is usually clear of side branches up to 70 or 100 feet; and its diameter ranges from 8 to 12 feet. The wood is straight-grained and brownish red in colour. It can easily be worked and polishes well. In its native country, the Pacific coast of North America, and in California generally, it is largely used for building purposes; and it serves also for fencing posts, railway-ties, shingles, telegraph poles—for which its straightness in young trees especially fits it—and for the staves of wine casks. It must not be forgotten that the expression "red wood" is also used, especially in Scotland, for the Scotch Pine, and it is better to distinguish *Sequoia sempervirens* by calling it the Californian Red Wood. It is probable that the strongly reddish hue of the exterior bark has given rise, in both cases, to the popular name. The American-Indian "twang" in the generic name is explainable by the circumstance that the Trees are called after an Indian of the Cherokee tribe, by name Sequoiah or Sequo Yah otherwise George Guess—who invented an alphabet and called it after his tribe; but what claim he had for giving his name to the Tree does not appear.

52.

SIBERIAN CRAB.

(Pyrus baccata.)

PRACTICALLY *Pyrus baccata* is an apple, and might have been included in our early chapter under the heading of Apple; but although the wild apple is really a "crab"-apple and is often so called, no one ever speaks of our present subject as an "apple"; nor even as a "crab," but just by the name which heads this page—Siberian Crab. Our reason for including it in this volume is because it has such an interesting individuality, and attracts so much attention in Kew Gardens by its elegant picturesqueness in the numerous forms in which it is seen there, that the reader of this volume would have the right to complain if some mention, however brief, were not made of it.

We shall have very little to say of it, because it speaks, rather eloquently, for itself in the illustrative presentments we give of it. It is grown largely for ornamentation. It has pretty oval, serrated leaves, groups of white flowers, which are very ornamental in the flowering season, and it produces an abundance of red and yellow fruit, which can be made into jelly and sweet preserves. It does not grow to a large size, but, nevertheless, for simple elegance of trunk, and

Fig. 219—Winter form of the Siberian Crab (*Pyrus baccata*).

what may be styled a symmetrical irregularity of ramification—for pretty leaves, striking blossoms, and handsome fruit it is well worthy of notice.

53.

SOPHORA.

(Sophora japonica).

A VERY brief notice must suffice for the Japan Sophora which we introduce as an interesting and ornamental Tree that produces, as our illustration will show, a very striking and picturesque bole. Its leaves are pinnate and dark bluish green in colour, each containing from 11 to 13 leaflets, egg-shaped acute and smooth; and its flowers are rather small, and are produced in large panicles or bunches, are cream-coloured, and are succeeded by seed contained in pods. The Tree grows sometimes as high as 50 feet. Its bark is dark green and smooth. It is a rapid grower, seedlings making about 12 feet in four or five years. A curious fact is, that in this country, although the Sophora (the word is derived from the Arabic word *Sophero*, and means a papilionaceous, butterfly-shaped flowering) Tree, produces abundant blossom and seed, the latter never ripens. It may be noted, by the way, that a number of our Trees introduced from hotter countries do not ripen their seed on account of the want of

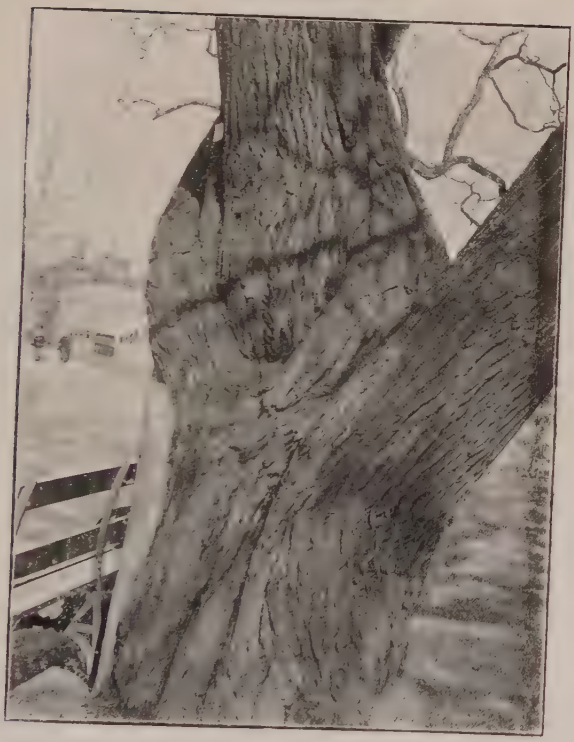


Fig. 220—Bole of the Sophora (*Sophora japonica*).

sufficient heat, although they grow vigorously and flower freely, and reach the seed stage.

The timber of *Sophora japonica* is compact and hard, as its appearance would suggest—our illustration is from a Kew Gardens specimen—and is not unlike box-wood in character. A strong odour exhales from the bark, and apparently affects those engaged in pruning it.

In the *Nouveau du Hamel* it is mentioned that a turner whilst at work on a piece of the wood was seized with colic and obliged to stop. Resuming the next day, the same thing happened, and others were similarly affected—the odour producing colic and violent purging. Both the flowers and fruit of this Tree produce a fine yellow dye; but the Sophora is chiefly valued for ornamental purposes; and its value is enhanced for this purpose by the circumstance that the leaves are not affected by heat, and do not discolour and drop off in summer, but retain the brightness of their foliage until the autumn fall.

54.

SPINDLE TREE.

(Euonymus europæus).

MORE a shrub than a Tree *Euonymus europæus* does attain a height sometimes of thirty feet and the doubt as between Tree and Shrub may be said to be popularly settled by its common name ; but it has earned a hedge-side reputation by the vividness of its summer green and the brilliant colouring, not only of

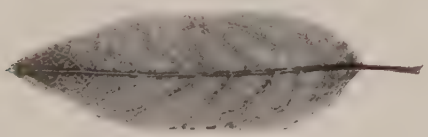


Fig. 221 Leaf of the Spindle Tree (*Euonymus europæus*).

its fruit, but of its autumn leaves. The wood was at one time employed for making spindles and in some parts of the continent of Europe may still be used for that purpose ; and hence its name. There is little pertinency, apparently, in its generic name, which comes from a Greek work meaning "of good repute," but its repute

is not apparently good because its leaves and fruit are bitter and poisonous. Perhaps the allusion is to its very beautiful appearance in the fall of the year. It has been called by several names, one of which is "prickwood," because of its employment for skewers and toothpicks. Its wood is hard and of a fine grain and its branches smooth. The green, often golden-green, leaves are borne on short stems and, like the twigs on the boughs, usually grow in opposite pairs. They are somewhat broadly lance-shaped, their tips being drawn out to a point. The venation consists of a prominent midvein, with alternately-branching very wavy, and occasionally forked, veinlets, proceeding in an irregular diagonal course to near the leaf margin, which is slightly toothed or serrated.

The greenish-white flowers of the Spindle Tree are small and four-petalled, and are borne upon cymes. The scarlet seeds, which grow in great abundance, are contained in four-celled cases, whose colour adds great beauty to the plant. A peculiarity of the roots of this Tree is, that they form a dense network of fibrous rootlets, which, however, usually keep in a compact mass, and do not spread very far from the stem. Like many others amongst the most beautiful of our wildings, *Euonymus europæus* is little cared for or cultivated in our gardens; although the freedom with which it grows and the ease with which it can be raised from seed should tempt the dwellers in our towns to nurture it, if only for the beauty of its autumnal dress, shown in its red-hued

leaves and in the brilliant colour of its abundant fruit.

But to descend from the beautiful to the useful it may be—after all—that the Tree has earned its

Fig. 222 -Leaf Spray of the Spindle Tree *(Euonymus europæus).*

generic "good repute" designation, when we consider the following extensive catalogue of what it can do. We cull the information from a botanical work quoted by Loudon. Speaking

of Spindle Tree uses, the writer says:—"In Britain it was employed in the manufacture of musical instruments; and it is still occasionally used for keys to pianofortes and by turners and coopers. In Scotland it is employed, along with the wood of the Alpine laburnum (*Cytisus alpinus*) to form noggins, called bickers . . These bickers are employed both as drinking vessels and as porridge dishes. . . In Germany shoots of three or four feet in length are bored and employed for the shanks of tobacco pipes. . . The wood, split up into thin pieces, is formed into whisks for driving away flies. A charcoal much valued by artists is made of the shoots, the lines traced with it being easily effaced. . . The fruits of the Tree have been employed by dyers who derive three colours from them: green, yellow and red. . . A decoction of the capsules, in alkali, is said to colour hair red. . . The fruit is said to be purgative and emetic in an eminent degree, so much so that it is not eaten by birds." We have omitted much detail in the preceding quotation because our volume is not concerned with the *modus operandi* by which Trees are made useful; but is only designed incidentally to catalogue their uses.

55.

SYCAMORE.

(Acer pseudo-platanus).

COWPER says :—

> "Nor unnoticed pass,
> The Sycamore, capricious in attire ;
> Now green, now tawny, and ere autumn yet
> Has changed the woods, in scarlet honours bright ;"

but it is fickle in its autumn as well as in its summer "attire," and, as the present writer pointed out some years ago in an autumnal note upon it, the Sycamore leaf does not present the variety or possess the attraction of many other leaves for the lover of autumn. He said : "The change of colour is generally indicated by the advance upon the tops of the lobes of a very light brown or drab tint—sometimes merging into brown, and occasionally red enough, though only occasionally—to warrant Cowper's designation of 'scarlet.' Set off against the dark-green hue of the summer leaf, the effect is often picturesque—the tinting penetrating the tissue, and, although shown most prominently upon the dark, upper surface of the leaf, it is also, though less conspicuously, noticeable upon its paler underside. As the discolouration advances it takes possession of the

Fig. 223—Leaf of the Sycamore (*Acer pseudo-platanus*).

spaces between the principal veins, the lines of tissue, however, on either side along the course of the principal veins remaining green longer than

any other portion of the surface, and forming an effective contrast with the decaying brown."

Fig. 224—Naked Spray of the Sycamore.

Practically, the Sycamore is a Maple, as its generic name of *Acer* indicates. Indeed, it is often called "The Great Maple," and Loudon calls t

so, and also "The Mock Plane Tree." Its leaves really resemble those of both Maple and Plane—being a sort of combination of the two. It is important to notice that this Tree is not the Sycamore mentioned in the Bible, for that was the Mulberry Fig of Palestine (*Ficus sycamorus*). According to the language of flowers a very different thing from the language of science—the Sycamore indicates "curiosity"; and that description originated from the belief that it was the Tree into which Zaccheus climbed to see the Saviour pass by on his way to Jerusalem, when people strewed leaves and branches of palm, etc., in His way, crying, "Hosanna to the Son of David!" The same belief induced people in the fourteenth and fifteenth centuries to plant it in their gardens and near their houses.

We give a leaf and a spray of leaves of *Acer pseudo-platanus*. The Tree does not grow to a very large size, not often extending beyond 60 feet in height. Gilpin says of it:—"The Great Maple, commonly called *The Sycamore*, is a grander and nobler Tree than the smaller Maple; but it wants its elegance; it is coarse in proportion to its bulk. It forms, however an impenetrable shade, and often receives well-contrasted masses of light. Its bark has not the furrowed roughness of the Oak, but it has a species of roughness very picturesque. In itself, it is smooth, but it peels off in large flakes, like the Planes (to which in other respects it bears a near alliance), leaving patches of different hues, seams and cracks, which are often picturesque."

Its flowers are borne in drooping, crowded racemes, and are greenish in colour and small in size. The seed-vessels are wing-shaped, and being red in colour, are conspicuous and noticeable, the winged receptacle aiding the dispersion of the flat, oval seed. A very rapid grower when in

Fig. 225 Leaf Spray of the Sycamore (*Acer pseudo-platanus*).

favourable positions, the wood is, nevertheless, firm and compact, though not very hard. In young trees it is white, in older ones yellow, and possessing a fine grain, easily polished, and showing no tendency to warp, it is employed by turners, cabinet-makers and sculptors for a variety

Fig. 226 – Winter Form of the Sycamore *(Acer pseudo-platanus).*

of purposes. The collected leaves form a good winter forage for animals, and sugar can be extracted from the sap.

56.

TAMARISK.

(Tamarix gallica).

LIVING and thriving luxuriantly in the sea breeze, which so many other plants dislike, the Tamarisk is especially valuable for the ornamentation of marine walks, and its purple stems and sea-green foliage make it a striking object, and although it is ordinarily seen as a low shrub, it can and does attain to Tree height, rising sometimes as high as 30 feet. Its favourite localities, for wild growth, are the south and south-east of England and the Channel Islands. It is not seen wild in the north, but, transplanted, it will grow anywhere, readily enough. It prefers a deep, sandy soil and the presence of water, and is frequently found in the neighbourhood of the sea, even when not transplanted to such positions. It is partially evergreen, and its leaves, of which we give a spray engraving, are very minute and pointed, and are borne alternatively on thread-like sprays which they clasp placed along small tapering twigs. The little pink flowers grow at the extremities of the sprays, are thickly clustered, and have the appearance, in the mass,

of flower spikes. The whole Tree when in bloom, has—leaf and flower—a very feathery look. The small seeds are tufted with hairs, which start from their apices. Both leaves and flowers are bitter to the taste, and have sometimes been used as a tonic, and for communicating a bitter flavour to beer.

Tamarix gallica can be readily propagated from cuttings, which should be planted in a position facing to the North; and its peculiarity of habit, as already indicated, is that it thrives best when exposed to sea breezes.

The Tamarisk is a very widely distributed Tree. Royle says: "The plants of the genus *Tamarix* are distributed over a wide extent of territory in the old world; from 10° to 50° and 55° of north latitude in Europe and Siberia; and from the Canaries and Senegambia in the west, to China in the east. They differ as much in their localities as in their latitudes; being found on the shores of the ocean, on the banks of rivers (as the Ganges and the Nile), as well as on the arid and sandy parts of Northern India and the Punjab; also in the cold and elevated climates of Thibet and Siberia; but in these the soil is saline."

One poet indicates its favourite positions in the lines:—

"On yon rough crag
Where the wild Tamarisk whistles to the blast."

Evelyn states that the ancients considered the Tree as accursed, and remarks, in proof of this, that the Romans wove wreaths of it to crown

their criminals. Loudon says of the order of plants to which our subject belongs :—" The properties of *Tamaricaceæ* are considered to be

Fig. 227—Leaf Spray of the Tamarisk *(Tamarix gallica).*

bitterness and astringency, and hence the occasional employment of the European species as a tonic, and as a substitute for hops in making

beer in Denmark. In India, also, the twigs of *Tamarix indica* and *Tamarix divica* are considered astringent; but the plants are more valued on account of the galls that are found on them and other species; and which being highly astringent, are used in medicine and dyeing. The ashes of *Tamarix gallica* and *Tamarix africana*, when growing near the sea, contain a large proportion of sulphate of soda, so that they may be profitably burnt to obtain this salt. Its abundance explains the utility of some of these plants as diuretics. *Tamarix gallica* grows on Mount Sinai; and by the puncture of *Coccus manniparus*, a species of manna is produced, which is known by the name of Arabian to distinguish it from the Persian manna, which is the produce of *Alhàgi mauròrum*. The Tamarisk was a celebrated medicinal plant with the ancient Arabians, from whom the Latins seem to have borrowed the high encomiums they bestowed on its virtues. Dr. Grindhall, who brought it from Germany, after he was made Archbishop of Canterbury, cultivated it chiefly for its medicinal virtues; and Master Richard Hakluyt, in 1599, tells us that many people have received great health by this plant."

57.

THORN

(*Cratægus oxycanthoides*).

UNDER the heading of "Hawthorn"—pages 180 to 186, we have already dealt with the general subject of this chapter: and, in strict sequence of botanical arrangement, the special plant now to be discussed should have been dealt with there; but as our particular method in the paging arrangement is alphabetical and popular rather than scientific, it is important to say something under the heading of "Thorn." To have omitted a "Hawthorn" heading would have left—where many people would look—a blank. Yet the farmer and the nurseryman nearly always call the familiar "May," with its exquisitely-perfumed blossom, simply "Thorn" because under that name it is bought and sold for hedge-making.

Cratægus oxycanthoides is merely a sub-species or variety of the normal form the Common Hawthorn—*Cratægus oxyacantha*. Both are "natives"; and the jealously exclusive botanist, Sir J. D. Hooker, in his British "Flora" gives only one other as "British"—the sub-species

Cratægus monogyna. That great botanist, the late Hewett Cottrell Watson—who spent the best part of a lifetime (from 1832, when 28 years of age, to 1874—forty-two years) on the study of

Fig. 228 Winter Form of a Hawthorn "Variety" *(Cratægus oxyacanthoides).*

British botany — says in his monumental and invaluable work "Topographical botany; being local and personal records towards showing the distribution of British plants traced through the

112 counties and (as he designates them) vice counties of England, Scotland and Wales" says under *Cratægus* "Different as the *oxycanthoides* and *monogyna* or *eriocarpa*" (another British sub-species) "appear in their extreme forms, I find many intermediates in Surrey, through cross-combinations of their technical characters." With this note we will conclude this chapter which is introduced also to give the pretty picture of the winter form of this interesting "departure" from the normal "Hawthorn."

58.

VIBURNAM

(*Viburnum pubescens*).

WE have already dealt with one *Viburnum* under the heading of "Guelder Rose"—pages 176 to 179—and shall describe another in chapter 60 under "Wayfaring Tree": but our present subject is selected because its common name is "Viburnum," or more accurately "The Downy Viburnum." It is not a Tree in our country, but doubtless is found of Tree size in its native regions, Carolina and Virginia, from which it was introduced into the British Islands in the year 1736. Here it is merely a shrub of about three feet high. It is, of course, a near relative to, and a species of the same genus as, the Guelder Rose and the Wayfaring Tree, and with them is included in the order *Caprifoliaceæ* which order includes several genera of hardy ligneous plants, mostly of a shrub character; and in that order it is included in the one of its two sections called *sambuceæ*, which comprises the well-known Elder—*Sambucus nigra*. The word *ligneous* by the way means, botanically, of a woody texture as distinguished from *herbaceous* which indicates plants that are soft and succulent.

The flowers of this species are white and are produced in corymbs, and the succeeding berry is small and oval in shape: but its leaves are

Fig. 229 Leaf of the Downy Viburnam (*Viburnum pubescens*).

veritable things of beauty and are a study in themselves. We take some little pride in the leaf we reproduce in black and white on this

page, because it is an absolute *facsimile*, so far as black and white can be a reproduction of form. The highest efforts of art must always fall far short of the exquisite loveliness of nature. We will not "give away" our secret as to how the *facsimile* was obtained beyond remarking that it was not by photography; and yet the black and white of the picture were produced by ourselves, by the aid alone of sunlight and the leaf itself.

If the reader will kindly take a powerful hand magnifying glass and look at our print, he will see more of the exquisite beauty of the venation than he can by his unassisted vision. The form of the leaf is what is called *ovate*, or egg-shaped. Its edges are broadly toothed. From stem to apex runs a prominent midvein. From this run branch veins, each to the point of one of the toothed lobes forking in one or two instances before reaching the leaf margin: but the reticulation of veinlets between the veins and over the whole surface of the leaf is what gives rise to its particular beauty.

How marvellous and beautiful are the intricate ways of nature for each one of this enormous number of sap canals is helping to carry the elemental substances which go to produce and maintain the inimitable framework on which the green life and beauty of the leaf are spread!

59.

WALNUT.

(Juglans regia).

"JOVE'S NUT" is the expression to be extracted from the generic *Juglans*, which is a contraction from *Jovis* Jove's –and *glans* a nut or acorn: and the excellence of the fruit, which has not deteriorated in quality by being "handed down," was the reason why this well-known Tree was called after the supreme deity according to Roman mythology; and the specific *regia*, which, for our purpose, may be translated as "splendid," further adds to the dignity and importance, so to speak, of the interesting and valuable subject of this chapter.

Roughness of trunk, expansiveness of foliage, sweetness of fruit, and beauty of timber, are amongst the characteristic qualities of the Walnut Tree. Delighting in good, rich, somewhat chalky and dry, soil, it is now found extensively growing throughout this country; and though not, in all probability, a native of Britain, it has been with us since the time of the Roman invasion, and was probably introduced amongst us by the Romans. It is believed to have been, in the first instance,

brought here from France, and its common name is supposed to be a corruption of "Gaul nut." Though the Romans considered that the shade of the Tree was injurious, both to mankind and to any vegetable undergrowth, it was very highly esteemed amongst them for its fruit, for food and for medicine.

The leaves of the Walnut are pinnate — the leaflets, oval, dull dark green, with a reddish tinge, rounded at both ends - and have short stalks. The venation is very prominent, consisting of a midrib, with alternate veinlets given off towards the unindented margin ; but curled upwards as they near the margin instead of proceeding straight to the edge. There is a very fragrant perfume, which probably a large number of persons have never noticed a strong lemon-scented odour in the leaves. It is said that some persons who have slept under a Walnut Tree in full leaf have been unpleasantly affected by this smell. It is certainly strongly aromatic, and the leaves retain the perfume for a long time if placed within the covers of a book. The flowers of the Walnut are borne on pendant catkins and are of two kinds — male and female — on the same Tree. It is a curious fact that the buds or spurs which ultimately develop into the barren flowers, protrude in the summer preceding their expansion from the axils of the leaves ; but this is not the case with the fertile or pistil-bearing flowers, which appear and develop into fruit in one season, after fructification by the stamens of the barren flowers. The fruit, or nut, is enclosed in a green, one-celled

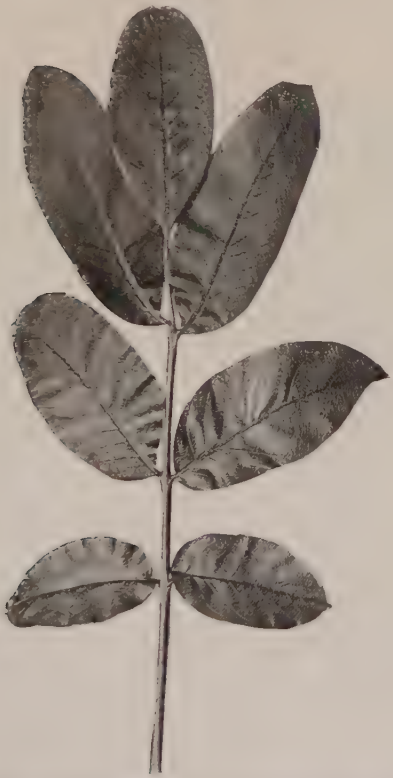


Fig. 230—Leaf of the Walnut (*Juglans regia*).

case; and is, whilst green, and before having ripened into the sweet brown, finely flavoured, shell-covered nut, made, as is well-known,

into a favourite pickle. The Walnut liquor, produced from the green nuts, has also been used

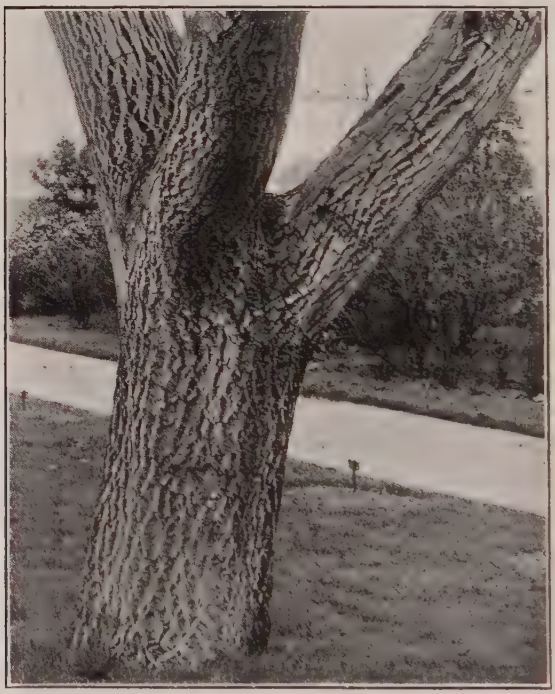


Fig. 231 Bole of the Walnut (*Juglans regia*).

as a medicine for strengthening the stomach. From the Walnut, too, is extracted an oil that is

used for burning in lamps, for various culinary purposes, and, by artists, for mixing with colours; its value, for this last-named purpose, arising

Fig. 232.—Winter Form of the Walnut (*Juglans regia*).

chiefly from its readiness to dry. The well-known Walnut dye is made both from the leaves of the Tree and from the husk of its fruit.

Walnut wood, as everybody knows, has a world-wide reputation for its beauty of grain and excellence of quality. Furniture of all kinds is manufactured from it, and indeed all sorts of articles which are required to be elegant are turned out from its timber by the carpenter, cabinet-maker and joiner. Its beautiful colours, markings, and the ease with which it can be manufactured give it a great and especial value.

The sere autumnal leaf of this useful Tree is not devoid of beauty, and when the leaves have gone there is beauty still in the form of stem and bough, and of twig, with its promise, in clustering buds, of future blossoming.

It is not surprising that the Walnut Tree was considered worthy to be dedicated to Diana, and amongst moderns the exhaustively-descriptive lines of the poet Cowley are deserving of quotation in full :—

"The walnut then approached more large and tall,
Her fruit which we a nut, the gods an acorn call:
Jove's acorn, which does no small praise confess,
To have called it man's ambrosia had been less;
Nor can this head-like nut, shaped like the brain
Within, be said that form by change to gain,
Or Caryon called by learned Greeks in vain;
For membranes soft as silk her kernal bind,
Whereof the inmost is of tenderest kind
Like those which on the brain of man we find,
All which are in a seam-joined cell enclosed,
Which of this brain the skull may be supposed,
This very skull enveloped, is again
In a green coat, her pericranium—
Lastly, that no objection may remain
To thwart her near alliance with the brain,
She nourishes the hair, remembering how

Herself deformed, without her leaves does show
On barren scalps she makes fresh honours grow.
Her timber is for various uses good,
The carver she supplies with useful wood.
She makes the painter's fading colours last ;
A table she affords us, and repast ;
E'en whilst we feast, her oil our lamps supplies :
The rankest poison by her virtue dies,
The mad dog's foam, and taint of raging skies.
The Pontic King who lived where poisons grew,
Skilful in antidote her virtue knew.
Yet envious fates, that still with merit strive,
And man, ungrateful from the orchard drive
This sovereign plant, excluded from the field,
Unless some useless nook a station yield.
Defenceless in the common road she stands,
Exposed to restless war by vulgar hands ;
By neighbouring clowns and passing rabble torn,
Battered with stones by boys, and left forlorn."

60.

WAYFARING TREE

(*Viburnum lantana*).

THE latin word *vies*, meaning to bind or tie, is supposed to have originated the generic name of *Viburnum*, in reference to the pliability of its branches, rendering them available for tying. Its common name is supposed to have been given to it in consequence of the mealy whiteness of the woolly pubesence on the undersides of its rather striking leaves, giving them a dusty, travel-stained sort of appearance. But the "wayfaring" idea in connection with this Tree seems to have struck William Howitt in rather a different manner, when he exclaims :

"Wayfaring tree! what ancient claim
Hast thou to that right pleasant name?
Was it that some faint pilgrim came
Unhopedly to thee?
In the brown desert's weary way,
'Mid toil and thirst's consuming sway,
And there, as 'neath thy shade he lay
Blest the wayfaring tree.

Or is it that thou lov'st to show
Thy coronets of fragrant snow,
Like life's spontaneous joys that flow
In paths by thousands blest?
Whate'er it be, I love it well;
A name, methinks that surely tell
From poet in some evening dell
Wandering with fancies sweet."

Although the "fragrance" of the snow is a matter of poetic license, the poet has woven a

Fig. 233—Leaf Spray of the Wayfaring Tree (*Viburnum lantana*).

charming conceit, and this Tree, of 20 feet at the most, is a very delightful inhabitant of the way-

side. The leaves are thick, soft, indeed velvety to the touch, and may be described as distinctly handsome. Their form is somewhat broadly pear-shaped, and each one has a short green stem. The venation on the upper side is not so distinctly and prominently shown as it is on the mealy underside. The mid-vein passing from the apex of the stalk to the apex of the leaf gives off from each side in alternation, a series of wavy branches which are beautifully forked towards their extremities. The entire arrangement of veins can be clearly discerned by holding the leaf against the light.

The blossoms are white, and crowded on the broad cymes or heads. In ripening, the berries become yellow and finally black. In Switzerland a kind of ink is made from them, whilst in Germany the young stems of the Tree, owing to their pliancy, are utilised for basket making and for other and similar purposes. Rapidly grown and readily propagated the Wayfaring Tree would furnish a desirable ornament to a garden if only for the striking beauty of its autumnal foliage which becomes in colour a deep rich red.

Here the author may again, perhaps, be permitted to quote from a previously published study of the progress of the autumnal colouring :— "The normal hue of the foliage of the Wayfaring Tree is a dull, deep green. At the commencement of autumn this gives place to tinges of orange, yellow and red, but the yellow is, ordinarily, of a deep tint, approaching orange. Sometimes the deep green hue turns uniformly to a golden green ;

at other times to a golden brown. The autumnal change is sometimes indicated by patches of orange that, bright in the centre, become gradually merged and finally lost in the surrounding green. At other times a reddish orange tint is given to the tissue; and, if minutely examined with the aid of a glass, it will be seen that the effect is due to the presence of small spots of red in the midst of slightly larger spots of orange. Great richness is given to such an appearance when small spots of the fast-departing green still linger on the surface of the tissue. The entire edge of a leaf, to the depth inwards of an eighth of an inch, is occasionally found of a rich crimson, whilst yet the summer green is spread upon the rest of the surface. Markings of red, or crimson, or reddish brown—sometimes also of golden brown and orange—are often splashed upon one and the same leaf, and interspersed with patches of green. A fine effect is produced when an almost incrimsoned leaf is mottled with bright yellow or golden brown; and the principal veins will sometimes remain bright green, whilst the whole of the adjacent tissue is coloured red or orange or brown. We are, of course, indicating only the prominent and, we may say, the representative shades of autumnal colouring; for a volume could not exhaust the catalogue of the actual varieties which may be found in our woodlands."

We have only space to briefly add that the wood of this very interesting Tree, being hard and white, finds several uses in cabinet making and turning.

61.

WHITEBEAM.

(*Pyrus aria*).

ITS mealy whiteness has given the name of White Beam, or in other words, white Tree — *beam* being the old Saxon for Tree — to *Pyrus aria*. The specific name of *aria* given to it, it is believed by Theophrastus, is understood to be derived from a country of that name in Asia where it grew.

Ordinarily seen in our hedges as a shrub, it, nevertheless, becomes a Tree as high, sometimes, as forty feet; and it grows erect and forms a compact head of foliage. Its roots, too, descend to a considerable distance into the earth, and ramify also for some way laterally from the trunk. The leaf is extremely beautiful, as our spray illustration will indicate. It is somewhat roundly oval in form, and is indented along the margin. The dividing mid-vein continuing the leafstalk, gives out on each side, symmetrical, almost parallel, branch veins which run to the edges of the leaf and near which forking veinlets run to the margin. The white flowers are borne on large corymbs and are succeeded by similar clusters of scarlet berries

which conspicuously adorn the autumn hedges. It grows rather rapidly for the first ten years at

Fig. 234—Leaf Spray of the Whitebeam (*Pyrus aria*).

the rate of two feet each year; but after twenty years it advances slowly.

The wood of the Whitebeam is close-grained, hard, yellowish-white in colour, and, for the ease with which it can be polished and stained, finds many uses in the manufacture of small articles. Its hardness causes it to be employed for cog-wheels. It is further made into knife handles, spoons, forks, axletrees, naves and felloes of wheels, handles for carpenters' and other tools, walking sticks and musical instruments. Charcoal of good quality for the manufacture of gunpowder, is also made from whitebeam wood. The fruit, though acid and astringent, can be eaten, when, like the Medlar, it is in a state of partial decay. Even a kind of bread has been made from the dried fruit, during times of scarcity, on the continent of Europe; also spirit has been extracted from the juice and beer has been made from it.

Perhaps the greatest beauty of its summer foliage is seen when the breeze stirs the golden green forms of the leaves, causing them to show the silvery whiteness of their under surfaces: but when "autumn comes anon" its colouring is very variously shown. Occasionally the whole leaf will turn almost uniformly to a bronze hue; at other times to a light-brown or a dark brown, or an orange, or a golden-brown or green, or to a rich russet hue. But the intermediate kinds of colouring are often very striking by the strong contrasts which they produce. Whilst the whole of one side, along the line drawn by the midvein, is a deep green, the other side will be coloured with bands of dark brown, of light brown and of

orange ; or one side may be brown and golden-green, whilst the other is brown and orange. Deep rich russet blotches will be found on golden-brown leaves, or golden-brown blotches may be found on dark russet leaves. One bright large spot of orange, or deep brown, may be in the middle, at the side, or on the top or bottom of a leaf ; or there may be bands along the spaces - symmetrically and regularly parted off by the parallel course of the veins - of green and gold and orange and brown and russet. These variations may be seen at the same time on the same Tree ; and when, as often happens, a considerable mass of still green leaves remains upon the Tree, a fine effect is produced by the deep contrasting hues of russet, orange and brown, all of which colours are, not infrequently, overspread by a deep tint of red, or reddish russet.

62.

WILD SERVICE TREE.

(*Pyrus torminalis*).

THE specific name of this Tree comes from the latin word *torminalis* which means "of, or relating to the gripes;" and one of the popular common names is "The griping-fruited

Fig. 235—Leaf of the Wild Service Tree (*Pyrus torminalis*).

Service Tree." This rather forbidding name, however, is hardly deserved; because, although the fruit is acid, it is not calculated to give griping pains when eaten, any more than other sour wild

fruit, unless eaten indiscreetly, that is to say in unreasonable quantities. Sour apples might produce just the same effect, and the Tree is a near

Fig. 236—Leaf Spray of the Wild Service Tree (*Pyrus torminalis*).

relation to the apple and belongs to the same genus—*Pyrus*. It grows to a height of 40 or 50 feet, and has a wide and spreading head. The

leaves are not unlike some species of maple, and hence it is sometimes called "The Maple Service Tree;" but they are more elongated than those of the common maple and the lobes are more pointed. The leaf, in fact, is extremely pretty, somewhat pyramidal in form, the margin being cut into from five to seven sharply-angled lobes, five or six small ones and a longer terminal lobe. The margins of the lobes are finely serrated and the venation is very symmetrical. From the mid-vein, which traverses the centre of the leaf, branch veins diverge, either in opposite pairs or in alternation, and run to the extreme points of the lobes. From all sides of the veins but chiefly from the sides towards the leaf margins—a few veinlets are thrown off; but these are not very prominent and cannot be seen well unless the leaf be held against the light, or its undersides be clearly examined. The ramification of veinlets over the rest of the surface of the leafy tissue is very elaborate and beautiful. In autumn the fresh green leafy surface changes to a light golden brown, which is relieved, here and there, by patches of brighter colour. The colouring is subject to few striking variations, but the handsome form of the leaf under rich, mellow shades of gold, and light delicate brown upon green that has not yet faded, presents an appearance, in the earlier part of the season of change, which contributes not a little to the loveliness of autumn foliage.

The flowers of the Wild Service Tree appear at the end of the twigs in large bunches; and the

resulting fruit, something like hawthorn berries but rather larger, is of a brownish red colour.

Pyrus torminalis is a slow grower, and although found pretty abundantly in the southern parts of England, is absent both from Scotland and Ireland. The wood is very similar to that of the whitebeam, last described, and is put to very much the same uses, when it can be found of sufficient size. Like the fruit of the medlar the berries of The Wild Service Tree should not be eaten until they are partially decayed. As an ornamental Tree it has much to recommend it.

63.

WILLOW.

(*Salix alba*).

AS one of the most eminent of English botanists who devoted a large part of a life of remarkable industry to the study of Trees has stated that the species of the genus *Salix* might be described as being "in a state of inextricable confusion," it will be readily admitted to be altogether beside the purpose of this little volume to attempt to give a description of the various characters, real or imaginary, which have been deemed sufficiently prominent to warrant the division of the genus into its abnormally large number of species. Our task, therefore, will be limited to some brief description, not of the hundreds of varieties said to exist in English collections or of the smaller number—over a hundred—affirmed to be natives of Britain, but of two or three of the most familiar of British Willows.

The first of these, and probably the best known, is the White Willow, so called from the exceptionally whitish-green of the leaves—this appearance being caused by the presence of downy white

hairs. It, like all the genus, is a rapid grower especially when planted in its favourite positions

Fig. 237—Naked Spray of the Willow, Showing Blossoms.

near water, and although it is mostly a Tree that becomes more broad than high, it will sometimes

extend to a height of 80 feet, and this at an average rate of four feet a year. Perhaps, how-

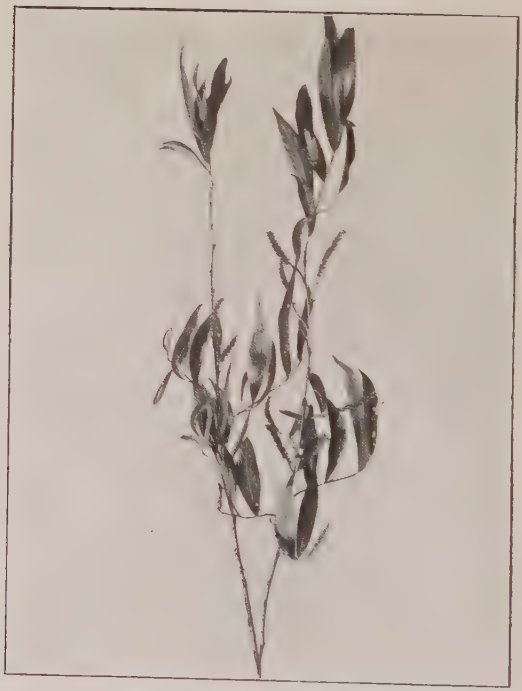


Fig. 238—Leaf Spray of the White Willow (*Salix alba*).

ever, it is not sufficiently accurate to give a yearly average, because the rate of advance is much

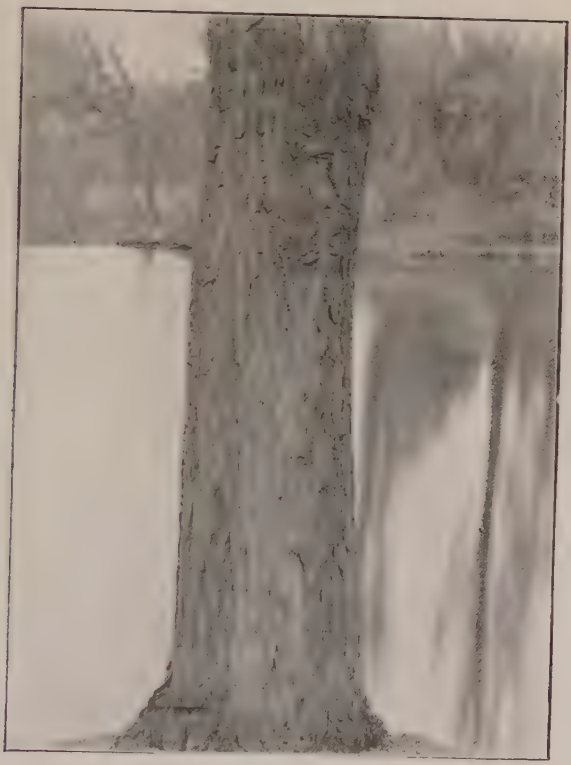


Fig. 239—Bole of the White Willow *(Salix alba).*

more rapid during the first half of the growing period.

Smoothness and flexibility of their branches are the peculiar characteristics of Willows and hence their extensive use in basket manufacture—an enormous industry—and for a multiplicity of other purposes. The leaves, as our spray will show, are narrowly lance-shaped, tapering considerably at each end, and they are very finely serrated on the edge. The venation consists of a prominent midvein, with veinlets running thence in oblique and parallel lines to the margin. The downy clothing of the Willow foliage gives it a singularly silky, silvery appearance. The flowers are borne on short cylindrical catkins, which are erect and not drooping, and they are very conspicuous in the flowering time. The male and female catkins are borne on separate Trees and each little oblong seed is found to be enveloped in a sort of cottony wool or hair, so abundant in the seeding time that it is used by many birds to soften the linings of their nests.

To increase the production of Willow twigs for basket-making the Trees are pollarded, a process which naturally deteriorates the quality of their solid timber, as the rain rots the top of the trunks where it has been cut; but when grown for timber and not for twigs Willow wood is valuable for many purposes of the carpenter and turner; for tool handles, for the wooden rakes used in gardening and farming generally; for some of the inner woodwork of ships, for barriers, roofs of houses—in this particular employment its great durability has been well established—for weather boards, for cooperage, for clothes props, &c. The bark

Fig. 240 -Winter Form of the White Willow (*Salix alba*).

Fig. 241 Bole of the Bay-Leaved Willow (*Salix pentandra*).

has been used for tanning leather and for manufacturing a cinnamon-coloured dye. The inner bark, Kiln dried and powdered, has even served,

Fig. 242—Bole of the Green Willow (*Salix viridis*).

in times of scarcity, for manufacturing a species of bread. To the uses just enumerated, Loudon adds

others in the following interesting paragraph:—"The bark, which is thick and full of cracks, is in nearly as great repute for tanning as that of

Fig. 243—Leaf Spray of the Weeping Willow (*Salix babylonica*).

the Oak; and it is also used, in medicine, in the cure of agues, as a substitute for cinchona;

Fig. 244—Bole of the Weeping Willow (*Salix babylonica*).

though it is inferior for both purposes to that of *Salix russelliana*. As fuel, the wood of this Tree

is to that of the Beech as 808 is to 1540; but the old bark makes a very useful fuel; and both it and the wood will burn when green, in which state it is said to give out most heat. The charcoal is excellent for the manufacture of gunpowder and for crayons. The ashes are very rich in alkali, containing more than a tenth part of their weight of that salt. In France, a fine blood-red colour is obtained from the bark; and that of the young tree is used in the preparation of leather for making gloves."

Gilpin, in descanting on the Willows generally, speaks especially in praise of our present subject. He says: "Some Willows I have thought beautiful and fit to appear in the decoration of any rural scene. The kind I have most admired has a small narrow leaf and wears a pleasant, light, sea-green tint, which mixes agreeably with foliage of a deeper hue. I am not acquainted with the botanical names of this specie, but I believe botanists call it the *Salix alba*."

The Weeping Willow, beloved of the poets, is *Salix babylonica*: and it must have been this species to which Shakespeare refers, anent the death of *Ophelia*, in the well-remembered lines:

> "There is a Willow grows ascaunt the brook,
> That shows his hoar leaves in the glassy stream,
> There, with fantastic garlands did she come
> Of crow-flowers, nettles, daisies, and long purples,
> There, on the pendent boughs her coronet weeds
> Clambering to hang, an envious sliver broke;
> When down the weedy trophies and herself
> Fell in the weeping brook."

And Montgomery, also, in the following genuinely poetical lines, had the same Tree in his mind :—

"Odours abroad the winds of morning breathe,
And fresh with dew, the herbage sprang beneath :
Down from the hills that gently sloped away
To the broad river shining into day
They pass'd ; along the bank the path they kept,
Where high aloof o'er arching Willows wept,
Whose silvery foliage glistened in the beam,
And fleeting shadows fringed the chequer'd stream.

This particular Tree derives its specific name from the fact that it was a native of Babylon and it is supposed to have been brought to England about the year 1730. Leaves, flowers and fruit are very similar to those of the White Willow; but the timber of *Babylonica* is not of much value. Its chief employment is as an ornamental Tree in those situations which it graces. And here it will be interesting once more to quote Gilpin, who says, in his *Forest Scenery* :—"The Weeping Willow is a very picturesque Tree. It is a perfect contrast to what we have just observed of the Lombardy Poplar. The light airy spray of the Poplar rises perpendicularly. That of the Weeping Willow is pendent. The shape of its leaf is conformable to the pensile character of the Tree, and its spray, which is still lighter than that of the Poplar, is more easily put into motion by a breath of air. The Weeping Willow, however, is not adapted to sublime subjects. We wish it not to screen the broken buttresses and gothic windows of an abbey, nor to overshadow the battlements of a ruined castle. These offices it resigns to the Oak, whose dignity can support

them. The Weeping Willow seeks a humbler scene—some romantic footpath bridge, which it half conceals—or some glassy pool, over which it

Fig. 245. Winter form of the Weeping Willow (*Salix babylonica annularis*).

hangs its streaming foliage—

"And dips
Its pendent boughs, stooping as if to drink."

In these situations it appears in character, and of course, to advantage. I have heard indeed

that the Weeping Willow is not naturally an aquatic plant, but its being commonly believed to be so is ground enough to establish it as such, in landscape at least, if not in botany."

With reference to this remark of Gilpin, it may incidentally be mentioned as a fact that one of the finest specimens in Kew Gardens—a variety (*annularis*, whose spray is not very pendulous) which we illustrate - is growing well away from any water ; and for the rapid development of this Tree it is more perhaps a question of a moist atmosphere and congenial soil than proximity to water.

Gilpin continues : "The Weeping Willow is the only one of its tribe that is beautiful. Botanists, I believe, enumerate sixteen species of Willow." (Shade of Gilpin– what would he say now to their enumeration!) "Some of them I have seen attain a very remarkable size. I remember seeing one, in a meadow near Witham, in Essex, which spread over a space of ground measuring twenty three paces. But in general all the Trees of this sort are of straggling ramification, and without any of that elegant streaming form which we admire in the Weeping Willow. I should rarely therefore advise their use in painting, except as pollards to characterise a marshy country, or to mark, in a second distance, the winding banks of a heavy low-sunk river, which could not otherwise be noticed."

The Bay-leaved Willow (*Salix pentandra*), introduces us, through its leaves, to the perfume of the sweet Bay Tree and hence its common name.

There is a beautiful specimen growing in Kew Gardens, the bole of which, of very handsome and substantial proportions, we illustrate in an engraving from a photograph. Its leaves are much broader and larger than those of the two species just described. They are light green, glossy and very fragrant, especially when rubbed by the hand. The flower-producing catkins too, are very fragrant. A species of resin exuding from the leaves makes them sticky to the touch. It flowers later than some other species of the genus about the beginning of June. Its twigs are considered, on account of their toughness and elasticity, to be very suitable for basket work; but the Tree is chiefly valuable for its elegant appearance and for its general fragrance.

The Green Willow (*Salix viridis*) is also a very handsome Tree and the specimen, whose splendid trunk we illustrate, grows on the margin of the lake in Kew Gardens. Sir J. D. Hooker appears to regard this species as merely a variety of the Brittle-twigged or Crack Willow (*Salix fragilis*), so called because of the ease with which a twig can be snapped. The Green Willow is also known as the Russell or Duke of Bedford's Willow; but Loudon regards it as a distinct species, calling it *Salix russelliana*. It grows sometimes as high as 90 feet—an exceptional height for a Willow. It was first brought into notice by a former Duke of Bedford about the beginning of last century. Curiously enough this species of Tree was an especial favourite of Dr. Johnson, and Loudon considers that it is the most valuable for commercial purposes of all the species of the genus *Salix*.

64.

YEW.

(Taxus baccata).

MUCH of genuine interest centres around the subject of this, our final, chapter. Sombreness of growth and sombreness of foliage are the persistent characteristics of the Yew. It does not, under any circumstances, become a tall Tree, its maximum height being only about forty feet; but it acquires oftentimes an enormous girth, instances of Yews of 24 feet in circumference being by no means uncommon, whilst, in some cases, girths of 30, 40, 50, and even more, feet have been recorded.

The evergreen leaves that have proved poisonous to cattle which have eaten them in a dry condition and, strangely enough, innocuous to the same cattle when eaten fresh are produced along the twigs in two opposite and crowded rows. They are of a very dark green colour, are shining, oblong, opaque, pointed and concave on their undersides, and they have a conspicuous midvein and are somewhat less than an inch in length. The male and female flowers are generally produced on different Trees, but sometimes both

kinds are produced on the same Tree. They grow on the undersides of the twigs. The male flowers are small in size and are clustered on the twigs in the form of scaly membraneous buds. The female flowers are somewhat like tiny acorns in appearance, with, however, red fleshy cups, enclosing seeds in the form of nuts, which are uncovered at the tops, like acorns protruding from their cups, and they are edible.

Slow of growth, continuing ordinarily to increase until it has reached the age of a hundred years, the Yew is a Tree of great longevity, often existing during several centuries. Like the Pine, it loses its side branches when it grows in large masses. Owing to its extreme slowness of growth, its wood, as might naturally be expected, is of considerable value. It is compact, yet elastic, flexible, and extremely hard, having, moreover, a singularly close grain. Its colour is either a deep brown or an orange red. Its slowness of growth causes it to produce very thin annual layers of wood, and it is this circumstance which occasions the fineness and compactness of grain and the hardness of the timber. In a piece of Yew no more than 20 inches in diameter, there have been counted the extremely large number of 282 annual layers, exhibiting the growth in the same number of years of only 5 feet in circumference.

In olden times the Yew furnished to archers their best bows, and though, to a large extent, our British Yew Tree wood is now disused for that purpose, it furnishes some of the best and

most valuable of native timber for the purposes of the cabinet maker. The Yew, however, although a slow grower, is comparatively easy of cultivation, and it may be propagated either by layers or

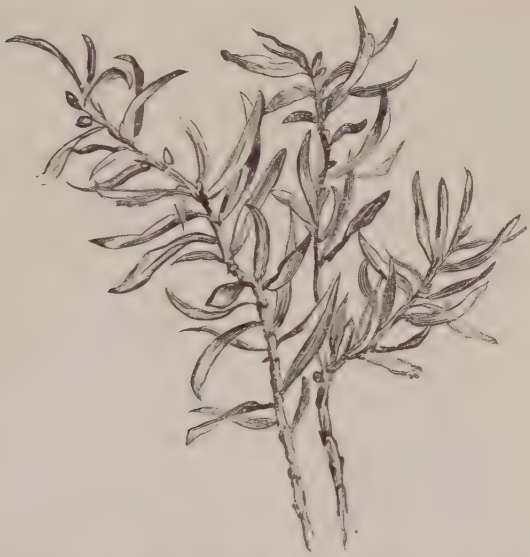


Fig. 246 Leaf Spray of the Yew (*From a Drawing*).

by seed, if planted in a moist and clayish or heavy loam soil, and in a sheltered or shady position.

As our illustration of a bole will show, the trunk is rough owing to the scars left by branches which have dropped off. The bark also peals off like that of the Plane Tree.

The explanation as to the derivations of the common and the generic names of the Yew are numerous and interesting. *Taxus* is supposed to come from *toxon*, a bird : also from *taxis*, arrangement, in allusion to the leaves being arranged on the twigs like the teeth of a comb. Another explanation is that it comes from *toxicum*, poison, in reference to the poisonous character of the leaves. The cetic word *iw*, signifying verdure, is believed to explain the origin of the common name and meaning evergreen verdure. Its association for so long a time with the burying places of the dead has given rise to various speculations, one of the most interesting of which is that of a botanical writer, Mr. J. E. Bowman, many years ago. He remarked : "Many reasons have been assigned for the frequent occurrence of the Yew in our churchyards ; but it seems most natural and simple to believe that, being indisputably indigenous, and being, from its perennial verdure, its longevity, and the durability of its wood, at once an emblem and a specimen of immortality, its branches would be employed by our pagan ancestors, on their first arrival here, as the best substitute for the Cypress, to deck the graves of the dead and for other sacred purposes."

And finally we must not forget Gilpin, who says : "After the Pine and Fir tribes, the Yew deserves our notice. The Yew is a pure native of Britain and was formerly what the Oak is now, the basis of our strength. Of it the old English yeoman made his long-bow, which he vaunted nobody but an Englishman could bend. In shoot-

ing, he did not, as in other nations, keep his left hand steady and draw his bow with his right; but keeping his right at rest upon the nerve, he pressed the whole weight of his body into the

Fig. 247 Leaf Spray of the Yew (*Taxus baccata*).

horns of his bow. Hence, probably arose the English phrase of *bending a bow*, and the French of *drawing one*. Nor is the Yew celebrated only

Fig. 248—Bole of the Yew (*Taxus baccata*).

for its toughness and elasticity, but also for its durable nature. Where your paling is most exposed, either to winds or springs, strengthen it

with a post of old Yew. That hardy veteran fears neither storms above nor damps below. It is a common saying, among the inhabitants of New Forest, that a post of Yew will outlast a post of iron. This much for the utility and dignity

Fig. 249. Two Leaf Sprays of Yew (*Taxus baccata*) Showing Flowers (right) and Fruit (left).

of the Yew. As to its picturesque perfections, I profess myself (contrary I suppose to general opinion) a great admirer of its form and foliage. The Yew is of all other Trees the most tonsile.

Hence all the indignities it suffers. We everywhere see it cut and metamorphosed into such a variety of deformities, that we are hardly brought to see it has a natural shape, or the power which other Trees have, of hanging with ease. Yet it has this power in a great degree, and in a state of nature, except in exposed situations, is perhaps one of the most beautiful evergreens we have. Indeed I know not whether, all things considered, it is not superior to the Cedar of Lebanon itself. I mean to such meagre representatives of that noble plant as we have in England. The same soil which cramps the Cedar is congenial to the Yew, and I have only to add in commendation of this Tree, that its veins exceed in beauty those of most other Trees. Tables made of Yew, when the grain is fine, are much superior to mahogany; and its root vies in beauty with the ancient Citron."

Our pleasant talk is now completed, and the little volume goes forth on what the Author sincerely trusts will be a pleasant and instructive mission. Trees it has already been said have been fittingly described as "the buildings of God;" and if the study and appreciation of their manifold forms of loveliness should lead the student to lift his thoughts in reverent adoration —to the divine Moulder of our wonderful and beautiful world, a great and noble object will have been achieved.

THE END.

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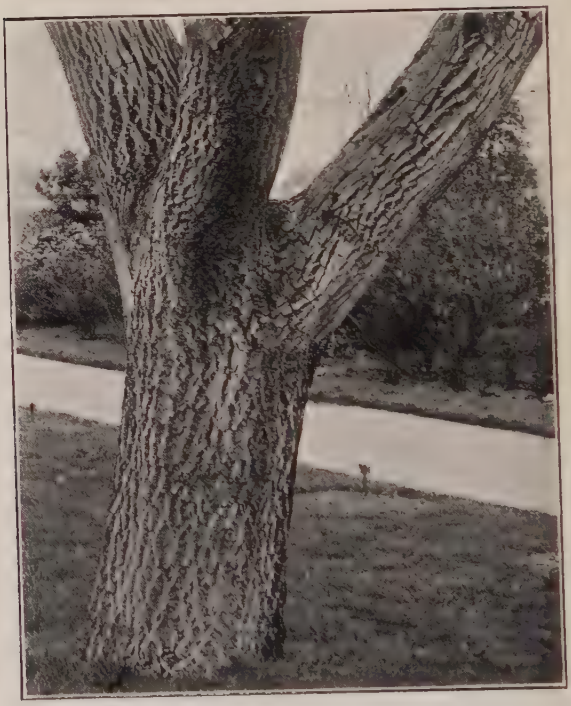
5. Royal Fern.—6. True Maidenhair.—7. Parsley Fern.—8. Bristle Fern
9. Moonwort.—10. Adders-tongue.—11. Little Adders-tongue.



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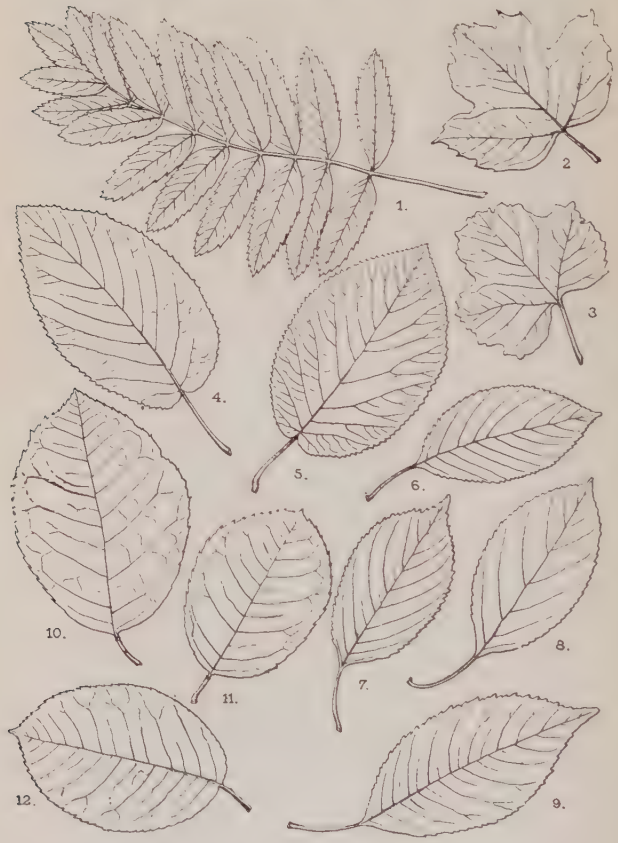
From *Our Woodland Trees* by Francis George Heath.

[PICTURE POST CARD] X.

PICTURE] [POST CARD

Leaves of British Trees and Shrubs.

(Showing the exact venation). [PLATE 7



Mountain Ash (*Pyrus aucuparia*) 1. Guelder Rose (*Viburnum opulus*) 2 & 3. Wayfaring Tree (*Viburnum lantana*) 4 & 5. Cherry (*Cerasus sylvestris*) 6 to 9. Bird Cherry (*Cerasus padus*) 10 to 12.

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Triticum repens
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Brachypodium sylvaticum
Habitats: dry parts of woods and hedges.
Flowers during July.

[PICTURE] XII. [POST CARD

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